DOCUMENT RESUME

ED 243 479 IR 050 704

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TITLE Automated Resource Sharing in Massachusetts: A Plan.
INSTITUTION Massachusetts Board of Library Commissioners, Boston.
PUB DATE Sep 83
NOTE 138p.
PUB TYPE Guides - Non-Classroom Use (055) -- Viewpoints (120)

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS *Databases; Guidelines; Information Needs; Interlibrary Loans; Library Catalogs; Library Circulation; *Library Networks; Objectives; *Online Systems; Program Design; *Shared Services; *State Programs; Statewide Planning
IDENTIFIERS Machine Readable Data; *Massachusetts; *Multitype Library Networks; Resource Sharing

ABSTRACT

This report presents a conceptual framework for developing a multitype resource sharing library network utilizing automated technologies in Massachusetts. Sections describe the need for a resource sharing network plan; past planning efforts; current library automation and cooperative activities; goals and objectives related to meeting the information needs of Massachusetts residents; user and library needs; activities and advantages of resource sharing networks; barriers to networking; automated networking; the mission statement for developing automated library networking in Massachusetts; principles which should be employed in designing the resource sharing network; the designated structure of the network; activities relating to the resource sharing mission statement; adherence to standards; network funding and governance; legislation needed to facilitate resource sharing in Massachusetts; the role of the Massachusetts Board of Library Commissioners in an automated resource sharing network; the need for and methods of bibliographic record conversion to machine readable form; making the public aware of the network; and network evaluation. Also presented are 10 recommendations for establishing an automated resource sharing network, a 106-item bibliography, a position paper by Roland R. Piggford, and a policy report on resource sharing among libraries within the Massachusetts higher education system. (ESR)

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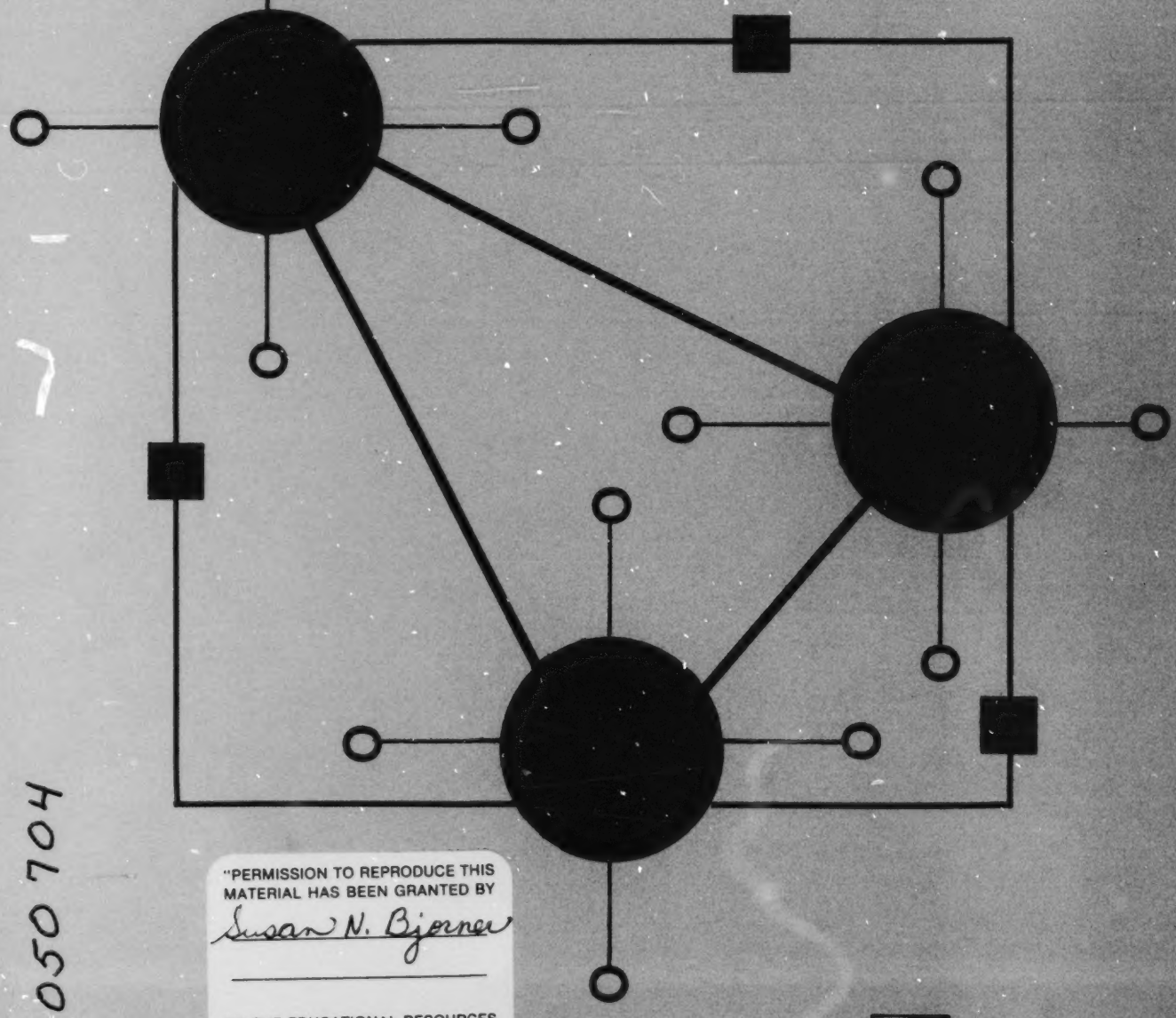

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AUTOMATED RESOURCE SHARING IN MASSACHUSETTS: A PLAN

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Chair. Automation Planning Committee

September 1983

Massachusetts Board of Library Commissioners

648 Beacon Street
Boston. Massachusetts 02215

*Printed with LSCA funds.
*Publication approved by Daniel D. Carter, State Purchasing Agent.
13561-140-500-3-84

IR 050 704

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EXECUTIVE SUMMARY

In a society that is becoming increasingly information dependent, there are few libraries, however well-funded and managed, that are capable of meeting all the information needs of their constituents.

There is increased access to information for library users when libraries agree to cooperate with each other to share their resources. Resource sharing is no longer supplemental to local library operations, but has become a basic element. A network of resource sharing cooperatives would increase the effectiveness of locally-based efforts, particularly when founded upon use of automated technologies.

The **overall goal for meeting information needs** is:

> To provide every resident of Massachusetts with equal opportunity to access that part of the total information resource which will satisfy the individual's educational, occupational, cultural, and recreational needs and interests, regardless of the individual's location, socio-economic status, possible physical disability, or level of intellectual achievement.

One of the **objectives** relating to the overall goal for meeting needs is concerned with resource sharing:

> Increase citizens' access to Massachusetts information resources by sharing resources as broadly and effectively as possible.

Librarians today acknowledge the impossibility of maintaining comprehensive collections and providing totally comprehensive services to their users based upon the resources of a single library. A goal of resource sharing is maximum availability of materials and services at minimum cost. The emphasis is on access to information rather than ownership of materials. Resource sharing arrangements among libraries provide the library user with access to resources beyond the local collection.

In its simplest definition, a library network is a mechanism which facilitates the sharing of resources among libraries for the mutual benefit of their clienteles. Objectives of a network can be summarized briefly:

- shared access to collections through expanded interlibrary loan and borrowing privileges
- coordinated collection development to avoid unnecessary duplication of materials
- shared access to bibliographic data
- continuing education and development of technical expertise of staff members

The computer's role in networking for resource sharing is one of mediation between the need on one hand to economize, and the need on the other hand to expand services in light of ever-increasing demands from users. The primary reason to utilize automation for resource sharing is that computers provide the necessary processing capabilities required for effective and efficient retrieval in terms of response time, storage capacity, and the necessary linkage and switching between components.

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Essentially, automated resource sharing networks are established to provide collectively three activities related to the goals of increased access and cost-effectiveness:

1. **search services** - database files which provide the searcher with bibliographic citations and/or abstracts of resources indexed in the database, or full document text, such as articles, transportation schedules, or current news stories.

2. **cataloging/interlibrary loan services** (ILL)- database files of shared machine-readable bibliographic records which are created by libraries during the cataloging process and which indicate library ownership; these files may be searched for interlibrary loan purposes.

3. **circulation/interlibrary loan services** (ILL)- database files of machine-readable bibliographic records which not only indicate ownership but also current availability status (on the shelf and available for loan, in circulation, or on the shelf for reference use) to the requester.

Principles

These principles are considered the basic attributes of a resource sharing network in Massachusetts:

1. Each individual has the right to access the information that meets his or her needs.

2. All network services should be provided at a level of operation as close to the user as possible. A local library should be the user's most efficient and appropriate service center. Therefore, network services should be provided through libraries as often as possible. The network must support local libraries, not compete with them.

3. The objectives of the resource sharing network should be realized without harm to the missions of participating libraries, although their methods of operation invariably must be adjusted. All libraries have a responsibility to collect the materials needed regularly by their own constituents. Resource sharing is not a substitute for local acquisition, only a supplement.

4. It is essential that the network enable individual libraries to maximize the gains of resource sharing while allowing for local flexibility; network members must understand and recognize existing individual constraints.

5. The resource sharing network should be built upon existing cooperative systems and existing library strengths. New resource sharing systems, built upon strong individual library collections and services, should evolve where existing cooperatives are no longer effective. The network should not compete with existing arrangements, but rather improve, redirect, and extend those already existing, and offer alternative approaches which will prove more valuable and useful.

6. Networking is not free. Besides equipment and material costs,

staff time is necessary to provide shared services. Therefore, each participant must be able to balance benefits with investment. This balance need not be measured solely in the traditional interlibrary loan concept of net borrowing versus net lending of materials. Attention also must be given to the increased benefits of improved access to more resources. A cost-benefit analysis is an appropriate methodology to study the benefits of network investment.

7. The financial and fiscal basis of the continued operation of network components must depend upon local rather than federal, state, and private funding sources. Local funding sources include assessed membership fees, cost recovery/reimbursement fees, and allocations from the institutions. Governmental and private grants and intermittent local fundraising are unreliable as a financial base since they are more apt to change annually.

8. Resource sharing efforts must not be limited to within the State. When and where economically, technically, and politically feasible and desirable, the State's resource sharing network and its related services should overcome geo-political boundaries, broadening access into the total information resources of the region and the nation.

Mission Statement and **Activities**

A mission statement for developing an automated resource sharing library network in Massachusetts is necessary to serve as a framework for network activities:

> Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

The library network concept for Massachusetts is based upon the linking by telecommunications of independent cooperative systems of libraries, each with a center that not only coordinates the internal activities of the system, but also serves as the cooperative's link with the centers of other systems. The network is hierarchical in that cooperative centers communicate with other centers in a planned outward and upward process.

Information needs do not recognize political boundaries. Massachusetts residents need access into the information resources of New England and the nation. The hierarchical network structure can provide a means for libraries to participate in the resource sharing activities undertaken in other states, when and if this becomes feasible and desirable.

Activities related to the Mission Statement are:

1. Develop and link bibliographic databases to provide greater access opportunities to resources.

   a. Develop access points into the information resource by expanding participation in online circulation/ILL control sys-

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tems where it is technically and economically feasible, and by developing new systems where they are needed. Second, develop other access points into the information resource, to be called Information Network Centers (INCs), which will be a cooperative effort of two or more local libraries (of the same or different types), in which one library houses the appropriate equipment to provide access for the public and member INC librarians to search, cataloging/ILL, and circulation/ILL services.

b. Develop telecommunications linkages between circulation/ILL clusters, and between INCs and circulation/ILL clusters, to expand the scope of resources available for accessing and sharing.

c. Develop interfaces between circulation/ILL control systems and cataloging/ILL utilities to ensure that the system's database file of bibliographic records is as current as possible for searching from other access points.

2. Develop document request and delivery procedures. Use electronic means to transmit resource requests whenever possible. Document delivery should utilize the fastest, cheapest, and most reliable means available.

3. Develop a program of computer literacy/training for librarians who are without direct access to computerized network systems.

Standards

Standards are necessary in any cooperative effort. In the automated resource sharing network, objective or technical standards will be adopted to facilitate the coordination of resource sharing in a network environment by ensuring compatibility.

Bibliographic control for the network must be based upon standardized cataloging rules and compatibility with the MARC format of the Library of Congress. A common format for bibliographic record structure will facilitate resource sharing communications between circulation/ILL systems.

Elements of an interlibrary loan form must be agreed to in the technical and cooperative agreements among network participants.

Standards utilized within the network will be evolutionary as the technology and the network develop. The Network Advisory Committee will continually monitor standards, policies, and operations.

Funding

The most successful networks are those in which the member libraries have made a significant commitment with funds from their operating budgets and view the services as an integral part of their operations. Because of the unpredictability of categorical federal funds, state funds, and private funds, ongoing network operations must depend upon local operating budgets and fees.

Local funds should be provided to the library for participation in the automated resource sharing network because it is more cost-effective than continuing the effort toward local self-sufficiency. However, it is a stated goal of the Board of Library Commissioners to increase access to the information resources of the Commonwealth. To encourage resource sharing by developing access points, the Board of Library Commissioners should provide capital funding, as feasible, for installation of central site circulation/ILL control systems and the establishment and first year's implementation costs of the Information Network Centers (INCs). Because of constraints on existing funds, the Board should approach the General Court for additional state funds for these capital investments, and for telecommunications and other functional costs associated with the establishment and operation of the resource sharing network.

The primary source of revenue for maintaining clusters and INCs will be membership fees paid by libraries from their operating budgets. In addition to local membership fees, cost recovery/reimbursement fees assessed to other libraries and, in some cases, users constitute another source of operational funds for clusters and INCs. It is both ethical and feasible to charge users for specialized services which go beyond the current community standard for free use.

Services between clusters and between INCs and clusters can be cost recoverable/reimbursible subject to state and local laws. The cooperative agreements between clusters and between INCs and clusters will result in the development of a hierarchical resource sharing network. There should not be fees for loans among cluster members: free reciprocal borrowing and/or interlibrary loan should be one of the benefits of belonging to the cluster. Higher up the hierarchy, though, fees for interlibrary loan may be imposed but should reflect cost recovery or reimbursement.

Governance

The purpose of the network in Massachusetts is to **voluntarily** coordinate, facilitate, and improve access to the information resources of libraries in the State. The network is not to interfere with the prerogatives of existing library boards.

Formal, written agreements need to exist to define network activities and responsibilities. In addition to the cooperative and technical agreements, circulation clusters should, at a minimum, incorporate as nonprofit, non-stock, membership corporations.

While nonprofit incorporation has many benefits, that type of incorporation under existing Massachusetts law would require municipal approval for circulation clusters with public libraries as members to purchase and own data processing equipment for the exclusive use of libraries. The Board of Library Commissioners should file legislation authorizing the creation of quasi-governmental data processing entities for the exclusive use of all types of libraries. Such entities should be empowered to utilize debt financing (bonding for capital equipment) to supplement fees.

Legislation

To facilitate automated resource sharing in the Commonwealth, it is recommended that at least three legislative proposals be studied, drafted,

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and filed with the General Court:

- Amend legislation to allow the Regional Public Library System to provide document delivery and retrieval to network participants that are not public libraries.

- File legislation creating quasi-governmental entities with data processing facilities for the exclusive use of various types of cooperating libraries.

- File legislation and/or receive special status from the telephone rate-setting Department of Public Utilities that would establish a lower telecommunications "library network rate" for participants.

It is essential that libraries, especially participants in the network, be able to take advantage of any statewide telecommunications effort that would be more cost-effective than leased lines. Therefore, the enabling legislation for the Massachusetts Corporation for Educational Telecommunications (MCET) should be amended to include library participation and input on the Board of Directors through an ex-officio, voting membership for the Director of the Massachusetts Board of Library Commissioners.

Role of the Massachusetts Board of Library Commissioners

The Board of Library Commissioners has the responsibility through legislative mandate to plan, develop, establish, implement, coordinate, monitor, and evaluate an automated resource sharing, multitype library network. The Board, therefore, should assume responsibilities for the overall development and coordination of network activities and aspects of the network as appropriate, draft and propose appropriate legislation, act upon recommendations from the State LSCA Advisory Council on Libraries, and establish a Network Advisory Committee charged with providing advice, submitting reports and recommendations, and providing evaluations to the Board concerning network activities.

Representatives to the Network Advisory Committee will be appointed by the Board of Library Commissioners and will include:

1. a representative from each automated circulation/ILL cluster whose computer system can be accessed via dial-up recommended by its members;
2. representatives from the Information Network Centers recommended by the participants;
3. two representatives from the LSCA Advisory Council recommended by the Chairperson;
4. two staff members of the Board of Library Commissioners recommended by the Director;
5. the Regional Administrators from the Regional Public Library System;
6. the Chairpersons of the standing Automation Committees of the Regional Public Library System;
7. a representative of the Massachusetts Conference of Chief Librarians of Public Higher Education Institutions (MCCLPHEI) recommended by the Chairperson;
8. a representative each from the Massachusetts Library Association, the Massachusetts Association for Educational Media, and a Massachusetts member each from the Boston Chapter of the Special Libraries Association

and the New England Chapter of the Association of College and Research Libraries, recommended by the respective Presidents;

9. a Massachusetts representative from each cataloging/ILL service recognized as such by the Board of Library Commissioners; and

10. a representative from each of the formally organized library resource sharing consortia or cooperating groups existing in Massachusetts, recommended by the Chairperson of the consortium or group. Consortia or groups must register with the Library Development Unit of the Board of Library Commissioners.

Public Information

The network is designed to increase access for residents to the State's information resources in a cost-effective manner by applying automated technologies to the resource sharing effort. Thus, utilization of the network will benefit both the user and the librarian. It is essential that both be aware of the capabilities the network will offer.

Librarians will be reached through media such as MBLC Notes, and informational meetings. Making the library user and potential user aware of the capabilities of the network will be substantially a local activity, through the local library with assistance from the Board of Library Commissioners and the Network Advisory Committee. In addition, the merits and activities of the network should be made known to the appropriate government officials, administrators, and managers at every political and organizational level.

Evaluation

Evaluation is necessarily an ongoing activity of the network. The Network Advisory Committee shall be responsible for developing network performance criteria measures and utilizing evaluation techniques to apprise the Board of Library Commissioners of network performance and worth and offer appropriate recommendations.

I. A multitype library resource sharing network based upon automated technologies should be implemented. The network will be hierarchical in that cooperative centers will communicate with other centers in a planned outward and upward process. All network services should be provided at a level of operation as close to the user as possible, and through local libraries as often as possible.

II. The Mission Statement and Statement of Related Activities of the automated resource sharing library network for Massachusetts should be adopted:

Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

1. Develop and link bibliographic databases to provide greater access opportunities to resources.

   a. Develop access points into the information resource.

      1. expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed.

      2. develop Information Network Centers (INCs) to serve as access points into the total information resource by providing INCs with the capacity of utilizing search, cataloging/ILL, and circulation/ILL services.

   b. Develop telecommunications linkages between circulation/ILL clusters and between INCs and clusters to expand the scope of resources available for accessing and sharing. Linkages between disparate systems should be explored and developed.

   c. Develop interfaces between circulation/ILL control systems and cataloging utilities to ensure that the circulation/ILL system's database of bibliographic records is as current as possible for searching from other access points.

2. Develop document request and delivery procedures.

   a. Use electronic means to identify library holdings and to transmit requests whenever possible.

   b. Document delivery should utilize the fastest, cheapest, and most reliable means possible.

3. Develop a program of computer literacy/training for librarians who are without direct access to computerized network systems.

III. The Board of Library Commissioners should support resource sharing activities in the State by providing state and federal funds for

developing access points as appropriate and feasible. In addition, the Board should seek state funds to assist in the costs of telecommunications.

IV. In order to facilitate resource sharing in the Commonwealth, cooperating groups of libraries receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with central site circulation/ILL control systems or equipment upgrade should agree to:

1. Provide at least five percent of their system ports, but not fewer than three ports, for telecommunications links from other access points in the State. At least one of the ports should be provided for dial-up access, and a toll-free line is desirable.

2. Install a circulation/ILL control system that can support the U. S. MARC format, data content and rules of AACR2, and authority control.

3. Adopt a bibliographic record structure developed with the Board of Library Commissioners.

4. Provide free reciprocal borrowing and/or interlibrary loan among members of the cluster.

5. Have their bylaws approved as to form by Board staff.

6. Allow other network participants to copy, at the other group's cost, the database of bibliographic records (as specified in the contract) to assist in the conversion of records from manual format to a machine-readable format.

7. Participate in the State's resource sharing network.

8. Incorporate as a nonprofit, non-stock, membership corporation under Massachusetts laws.

V. In order to facilitate resource sharing in the Commonwealth, Information Network Centers (INCs) should:

1. Be in a library open to users and librarians.

2. Be an ongoing, cooperative effort of at least two libraries (of the same or different types).

3. Provide access to search, cataloging/ILL, and circulation/ILL services as specified in the contract with the Board of Library Commissioners.

4. Create machine-readable records via a cataloging/ILL service incorporating the MARC format and AACR2 codes.

5. Participate in a cataloging/ILL service that provides access to the database's bibliographic record file with holdings information for interlibrary loan purposes.

6. Demonstrate that they possess sufficient personnel and other resources within the INC membership to support continued operations.

7. Assume operational costs of the services after the first year.

8. Acquire modems capable of transmission at 1200 baud with downward capacity to 300 baud.

9. Use ONTYME II as one electronic mail service.

10. Sponsor and conduct workshops demonstrating search, cataloging/ILL, and circulation/ILL services to librarians.

11. Participate in the State's resource sharing network.

VI. Technical and cooperative agreements should be established between circulation/ILL clusters, and between Information Network Centers (INCs) and clusters, defining such areas as fees, scope and level of cooperation, responsibilities, communications protocols, document request and delivery procedures, and others.

VII. The Board of Library Commissioners should monitor and participate in the development and implementation of the statewide network proposed by the Massachusetts Corporation for Educational Telecommunications.

VIII. The Board of Library Commissioners should:

1. Amend existing legislation to allow the Regional Public Library Systems to provide document delivery and retrieval to network participants that are not public libraries.

2. File legislation to create quasi-governmental data processing entities for the exclusive use of various types of libraries.

3. File legislation and/or receive special status from the telephone rate-setting Department of Public Utilities that would establish a lower telecommunications "library network rate" for participants.

4. Amend existing legislation to include the Director of the Board of Library Commissioners as an ex-officio, voting member of the Board of Directors of the Massachusetts Corporation for Educational Telecommunications.

IX. The Board of Library Commissioners should establish the Network Advisory Committee charged with providing advice, submitting reports and recommendations, and providing evaluations to the Board concerning network activities.

X. The Board of Library Commissioners should coordinate, with the Network Advisory Committee, a public information program about the network for state residents and librarians.

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INTRODUCTION

The attached document "Automated Resource Sharing in Massachusetts: A Plan" is intended to provide a conceptual framework for the structuring and activities of a multitype resource sharing library network utilizing automated technologies. As a structure, the network is composed of independent units which act as access points into the information resources of Massachusetts, New England, and the United States. These units, referred to as circulation/ILL (interlibrary loan) clusters and Information Network Centers (INCs) are themselves linked to each other through telecommunications, and through technical and cooperative agreements.

The purpose of the network is to help librarians to locate, request, and receive information wanted by their patrons as efficiently and effectively as possible. Two assumptions are made. First, people have a need for all types of information located in all types of sources in all types of libraries. Second, libraries cannot be self-sufficient because they lack the financial resources and/or the physical space to acquire and store all the materials needed by their patrons to meet their needs. Resource sharing provides libraries with a means to meet those needs.

While it is important, and necessary, for all libraries to be resource sharers, it must be emphasized that resource sharing and interlibrary loan are not substitutes for local acquisitions. All libraries have a responsibility to gather materials needed regularly by their patrons. Resource sharing is intended to supplement this basic library service.

The "local library" referred to in the document denotes any type of library which is considered by the user to be his or her primary source. For example, an undergraduate student may consider the college's library as the local library. A technician's local library may be the collection of materials at the company. In most instances, the local library is capable of providing interlibrary loan services for its users.

The basis of the network is the development, continuation, and linking of physical access points into the information resources of the state's libraries. In its simplest form, an access point (circulation cluster or INC) locates which library owns a desired item. Requesting and receiving that item may occur at the access point or through the user's local library. Not all libraries will be access points although one expectation is that most libraries will either become an access point or share an access point with other libraries. In the network framework, the access points utilize automated means to locate materials, ascertain availability status if possible, and request the items. In the future, delivery may become more automated as machine-readable formats evolve. The point is that the network's purpose is to locate information resources and provide for their sharing using automation as an effective and efficient process. The network is not to become a bank of computers.

One of the most effective means of conducting interlibrary loan is utilizing an automated circulation control system. Turnaround time for document request and delivery can be reduced because requests are forwarded only to libraries known to own the item, and more likely forwarded only to those libraries with the item immediately available. Linking the circulation/ILL control systems using telecommunications enables a library in one cluster to search the holdings of another cluster, expanding resource sharing capabilities. A result will be less burden on current

heavy lenders as more libraries participate in sharing resources.

However, not all libraries can participate in circulation clusters because of financial and other constraints. Yet users of these libraries still have information needs, and it is prudent for their libraries to participate in the resource sharing network. As a solution, the concept of the microcomputer-based INC was developed. Using the telecommunications capability of the microcomputer, the INC will provide search, circulation/ILL and cataloging/ILL services for its library participants. Search services which provide database files in information retrieval databases (BRS and DIALOG, for example), expand the local reference function. INCs will also have the technology to dial into the holdings files of circulation/ILL clusters to ascertain the location of requested items. Third, INC participants will use a cataloging utility or service to create machine-readable records of their acquisitions. Not only will the INC be able to search the holdings of the other members of the utility/service to locate materials, but the machine-readable records INCs create can be accessed by other utility/service members also searching for items. As a result, INCs will be lending as well as borrowing materials.

Network standards, evaluation, public relations, and other issues are discussed throughout the document. However, the Network Advisory Committee's (NAC) purpose and responsibilities may need some additional discussion. The Board of Library Commissioners is responsible for the planning and implementation of activities and aspects related to the network. Many recommendations concerning the network such as priorities, revising this document, and others will come from the LSCA State Advisory Council on Libraries. However, both the Board and the Council are concerned with matters of a broader nature, and are not, on the whole, network participants. Therefore, the NAC was designed to assist and advise the Board and the Council on network activities and operations through reports, studies, and recommendations. Such studies may include:

- telecommunications alternatives
- legal issues concerning shared bibliographic records
- model technical and cooperative agreements
- document requests via microcomputers
- communications between disparate circulation/ILL control systems
- document delivery (it used to be so simple)
- new technologies and their impact upon network structure and services

Broad-based and composed of both network participants and representatives from library associations, organizations, and consortia, the NAC will also serve as a forum for discussion of network concerns and issues and provide a communications link for the human aspects of networking.

To update section two of this document (Past Planning Efforts): the Automation Planning Committee (APC) met throughout the fall and winter. Members developed an outline of the network's objectives and activities that was discussed with librarians attending the March 16, 1983 informational meeting of the Massachusetts Corporation for Educational Telecommunications (MCET). The LSCA Statewide Advisory Council on Libraries reviewed the outline on April 21. Comments from both groups were incorporated into the first draft of this document, completed in May. On June 16 the APC adopted a revised draft, copies of which were mailed on June 30 to two hundred librarians and organizational representatives throughout the state for comment. The APC also recommended to the LSCA Advisory Council

that the document and its recommendations be approved. which the Council did at their meeting of July 27. On August 11 the Board of Library Commissioners voted to accept the recommendations of the APC and the LSCA Advisory Council "that the document entitled Automated Resource Sharing in Massachusetts: A Plan be approved as a conceptual framework for the development of a statewide multitype library resource sharing network for Massachusetts and serve as the current update for the LSCA long range program for Massachusetts."

Implementation of network activities and operations will take time. The Board of Library Commissioners will need to establish priorities with the assistance of the LSCA Advisory Council and the NAC. Furthermore, this document and the network are intended to be dynamic and must be continually reviewed, incorporating modifications, gained experience, and new theories and technologies. It is essential that this plan be kept current to provide librarians in the state with a guide to the Board's concept of resource sharing and networking.

The content of the document is necessarily choppy. To explain fully some of the technologies or concepts discussed would have increased its length by several hundred pages. The ALA Glossary of Library and Information Science edited by Heartsill Young (ALA. 1983) provides adequate definitions for many of the terms used. Readers who may want more in-depth information are directed to the footnotes and bibliography. Staff members of the Board and NAC members should endeavor to maintain the currency of the bibliography.

Finally, although not appropriately a part of an introduction. the acknowledgement of several people cannot be ignored. Members of the Automation Planning Committee spent considerable time developing this document and beat the bureaucratic odds by completing it. The Board's Agency management team including Roland Piggford, Director, Mary Burgarella. Head of Library Development, and Irene Levitt. Business and Personnel Manager, provided enough support to have completed three plans. Tom Scully, Director of the Peabody Institute Library in Peabody, shared his experience and vision. Barbara DeYoung, Director of the Lawrence Public Library, and Anne Reynolds, Director of the Wellesley Free Library, served as sounding boards throughout the effort. Christine Kirby of the BLC staff provided editorial assistance. Lisa Keller, EDP Programmer, and Mary Litterst, Planning and Research Specialist, provided assistance wherever needed. Two other members of the Fiscal Planning and Systems Development Unit of the Board were critical to the document's completion. Ann Desmond edited the handwritten drafts and word processed (and word processed and word processed) the text. Susan Bjorner, Automation Consultant, served as principal editor, logistician, and advisor. Without Ann and Susan, this plan would still be just a lot of talk.

Robert Dugan
Chair. APC
September 1983

1. WHY IS A RESOURCE SHARING NETWORK PLAN NEEDED?

People need information contributing to survival and success in living. They have always needed it, but now, in our complex society, this need is growing and becoming more obvious.[1] In a society that is becoming increasingly information dependent, there are few libraries, however well-funded and managed, that are capable of meeting all the information needs of their constituents.[2]

There is increased access to information for library users when libraries agree to cooperate with each other to share their resources. Resource sharing is no longer supplemental to local library operations, but has become a basic element. A network of resource sharing cooperatives would increase the effectiveness of locally-based efforts, particularly when founded upon use of automated technologies.

A plan to provide guidance for incorporating and developing resource sharing cooperatives and activities into a Massachusetts network which utilizes automated technologies to increase access to information resources is needed because:

- It is important for all libraries to share resources with other libraries of all types. There are many barriers to resource sharing; these barriers, however, could be reduced or eliminated by designing a network that not only increases access and sharing, but also allows for necessary local flexibility.

- A viable structure will increase the ability of libraries to locate and deliver needed materials to library users effectively and efficiently.

- Every existing cooperative is currently pursuing its own independent course. Guidance and coordination are essential or so much variation will develop that it will become increasingly difficult for the cooperatives to interact with each other. Coordination is particularly imperative in the application of bibliographic and communication standards.

- It is likely that any re-authorization of Title III of the federal Library Services and Construction Act (LSCA) will require a resource sharing plan as a component of the annual Basic State Plan, which must be filed in order to receive funding.

- The Massachusetts Legislature, a potential source of funding for aspects of the network, would need a plan prior to considering funding.

- Foundations and private sector corporations may be interested in assisting planned efforts designed to benefit members of the community at large and their employees in particular.

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1. National Commission on Libraries and Information Science, Library and Information Service Needs, p. 268.

2. David Boals. "Interlibrary Loan Networks." pp. 124-5

- A library network should plan to utilize the telecommunications network being designed and implemented by the Massachusetts Corporation for Educational Telecommunications (MCET) as 1) an alternative/optional telecommunications mode between network components, and 2) a source or vehicle for library and/or network programming locally and statewide, and 3) for teleconferencing among and between librarians and libraries. The effort to use the MCET network must be planned and implemented immediately.

For the current or potential library user, resource sharing activities would broaden the scope of the resources available to meet informational needs.

2. PAST PLANNING EFFORTS

Several efforts have been undertaken in the recent past to plan resource sharing cooperative activities. This particular retrospective begins with a 1975 conference and brings the planning effort to the present.

Conference on Interlibrary Cooperation in 1975[3]

In June 1975, the Massachusetts Board of Library Commissioners appointed a Planning Committee composed of librarians from all types of institutions, chaired by Paul Perry of the Gutman Library of Harvard University's Graduate School of Education. The Committee was charged with arranging a Conference on Interlibrary Cooperation. The primary purpose of the Conference was "to suggest priorities toward statewide sharing of library, media and information resources so as to provide greater access to these resources for all citizens of the Commonwealth."

The Planning Committee engaged Dr. Andrew Ford of the New Hampshire College and University Council as Conference Facilitator to help plan and conduct the Conference. Attended by 65 librarians drawn from all types of libraries throughout the State, the Conference was held at the University of Massachusetts during November 10-12, 1975. Participants were divided into five groups reflecting overall Conference composition and were asked to address the following three questions:

1. What library and user needs are not being met adequately?

2. What obstacles stand in the way of meeting their needs?

3. What are some of the solutions to these obstacles and recommendations to the Board of Library Commissioners?

The Conference Facilitator prepared a summary report that would serve both as a framework for presenting the Conference's solution and recommendations, and as a basis for resolving apparent contradictions between the group's recommendations. He reported that the participants believed that all libraries in the Commonwealth should be considered as a total, single resource and that the Board of Library Commissioners should formally adopt this point of view; that parts comprising this whole resource are autonomous and ought to remain so and be treated as such; and that the Board, with the library community, ought to work toward the optimum utilization of this valuable resource.

However, the Planning Committee noted that some Conference participants were not in agreement with the Facilitator's summary. Responding to a questionnaire, participants developed a brief summary of Conference results:

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3. Conference on Interlibrary Cooperation, "Cooperation among Massachusetts Libraries."

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1. The Conference gave immediate priority to a re-examination of the overall structure affecting libraries, including funding, legislation, and communications. Also given immediate priority were community needs assessments.

2. An intermediate priority was to improve the use and sharing of existing resources through better use of technology and other means.

3. Less emphasis than the above was given to items such as: user payments to libraries directly for special services, shared processing to free professional time, training for governing and advisory bodies, and specifying and answering the needs of special classes of users and non-users.

State Advisory Council on Libraries[4]

The LSCA State Advisory Council on Libraries is responsible for updating the annual Long Range Program for Library Development as required under the Library Services and Construction Act as amended by P.L. 91-600. In 1977, the State Advisory Council on Libraries revised the Long Range Program and included discussion of and recommendations for library cooperation.

A survey on interlibrary cooperation was mailed in 1977 to approximately 1,200 public, academic, school, and special libraries in the State and to the three administrators of the Regional Public Library System. It concerned current activities in interlibrary cooperation. The survey was designed to indicate:

1. any cooperating groups in which the responding library was a member;

2. cooperative activities in which the library was currently engaged;

3. cooperative activites which might enhance services to patrons; and

4. existing or anticipated reasons why a library might not participate in cooperative activities.

The majority of public library respondents indicated no cooperative activities other than their participation in the services provided by the Regional Public Library System. Cooperation among individual school libraries within a school system was not universal. Informal cooperation between the school libraries and public libraries was indicated frequently by the school library respondents; such cooperative activities, however, were primarily conducted on a professional level of librarian-to-librarian, rather than on an institutional level. Special libraries cooperated primarily and informally among themselves. Survey results also indicated that academic libraries constituted the primary membership in most of the formally organized groups in Massachusetts.

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4. Massachusetts Board of Library Commissioners, Linking Informational Needs.

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The questionnaire also asked librarians to rate specific cooperative activites by priority and benefit. The first priority of all respondents was reciprocal borrowing. With all but the school libraries, the second priority was expanded interlibrary loan.

Overall, survey results indicated a willingness on the part of Massachusetts libraries to cooperate, with recognition of the restrictions placed on them by their administration and clientele. Furthermore, respondents indicated that only adequate, sustained funding and provision of sufficient staffing would permit all types of libraries to consider seriously initiating and expanding cooperation throughout the State.

The LSCA Advisory Council agreed on an overall goal for meeting needs:

> To provide every resident of Massachusetts with equal opportunity of access to that part of the total information resource which will satisfy the individual's educational, working, cultural and leisure time needs and interests, regardless of the individual's location, social or physical condition, or level of intellectual achievement.

Additionally, a Statewide and Regional Impact Program was developed with the purpose:

> To provide every resident with equal opportunity to access that part of the total information resource which will satisfy the individual's needs. To accomplish this goal, a statewide plan must be developed which provides a united front for libraries in planning priorities, policies, and programs for all types of resource sharing and for seeking the funding/legislation necessary to implement them while balancing all library interests. The development of this plan shall be the major goal of this five-year program.

In 1980, the purpose of the Statewide and Regional Impact Program of the Long Range Program was amended to include:

> Recognizing the role that automation can play in resource sharing and the cost-effective operation of libraries, efforts will be made to study, evaluate and make recommendations for the future development of automation in Massachusetts libraries.

The next year's Long Range Program unveiled a revised purpose for the Statewide and Regional Impact Program that remains in effect to date:

> To provide every resident with equal opportunity of access to that part of the total information resource which will satisfy the individual's need. To accomplish this goal, projects for all types of resource sharing are encouraged. Recognizing the role that automation can play in resource sharing and the cost-effective operation of libraries, projects which facilitate resource sharing among libraries using automation in the process of development of a compre-

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hensive database will be a priority.

The development of a resource sharing plan within the five-year period targeted in 1977 was not fulfilled, although it was attempted several times. The latest effort was well underway at the end of 1982. However, the LSCA Advisory Council clearly revised the purpose of the Statewide and Regional Impact Program throughout the five years, from developing a resource sharing plan in 1977 to studying automated resource sharing in 1980 to designating, as a priority in 1981, the use of automation in developing resource sharing databases. The intent of the proposed plan was evident; missing was the text.

Governor's Conference, 1978-1979[5]

The Massachusetts Governor's Conference on Libraries and Information Services was held on April 26-27, 1978 and March 27, 1979 in preparation for the White House Conference on Libraries and Information Services in late 1979. Unlike the previously held Governor's Conferences, the 1978 Conference was not composed primarily of representatives of the library/information science community. Instead, the Conference's 180 voting delegates were predominantly lay people.

Among the many resolutions passed by the Governor's Conference was this:

> Whereas the bulk of support for library resources is at the local and institutional level, and whereas given the fact that geographic, institutional and political boundaries mean nothing to the individual seeking information, therefore be it
>
> RESOLVED: 1. that systematic research and planning should take place on local, regional, state, and national levels for sharing resources and services;
>
> 2. that there be adequate federal aid to encourage, support and sustain intertype library cooperation;
>
> 3. that such cooperation consider existing networks and include an adequate needs assessment to avoid duplication;
>
> 4. that such federal aid should augment and enrich already funded programs at all levels; and
>
> 5. that such funding be made available to individual libraries, to state libraries and to networks themselves.

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5. Sandra Waddock, Final Report of the Governor's Conference on Libraries and Information Services.

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This resolution was among the top ten priorities the Massachusetts delegation carried to the White House Conference.

State Government Efforts

In the past two years, the State government has become noticeably more concerned with the sharing of library resources through networking. In July 1981, Policy Report #13 appeared in the Senate's FY1982 budget narrative. A discussion of library resources available in the public higher education institutions, the report supported the development of a comprehensive, machine-readable database of holdings of library materials in the State's college and university system to stimulate resource sharing. A retrospective conversion process utilizing the bibliographic resources of OCLC (Online Computer Library Center) was recommended as the most viable, cost-effective method of constructing the holdings database.[6]

Roland Piggford, Director of the Massachusetts Board of Library Commissioners, prepared a position paper as a response to Policy Report #13. Building holdings databases was a cost-effective approach to resource sharing, but the concept should be broadened to include libraries of all types instead of the single-type (public academic libraries) advocated in the Report. Not only would the more comprehensive database intensify the economies of scale phenomenon, but it would increase the scope of the total information resource accessible to all residents of the Commonwealth. The Board of Library Commissioners, as the state library agency, was responsible for developing a planning effort for the design of an effective statewide multitype library automated resource sharing network. [7]

In December 1982, Governor King signed into law legislation creating the quasi-governmental Massachusetts Corporation for Educational Telecommunications (MCET). Its primary purpose is the design and implementation of a telecommunications network linking the various educational institutions of the Commonwealth in order to share resources more effectively and to establish a vehicle for providing programming to remote sites - homes, businesses, governments, institutions, etc.[8]

Libraries can take advantage of the MCET network in at least three ways. First, MCET will develop alternative telecommunication linkages (cable, microwave, satellite) not based on telephone lines. Communications from library to library for automated resource sharing are currently based upon dedicated, leased, analog telephone lines. The substitution of MCET's alternative network modes, where possible, for the leased lines may yield a considerable cost savings. Second, because they are located in almost every municipality, libraries could serve as switching points in the MCET network, locally rebroadcasting video programs in-house or to remote sites

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6. Massachusetts General Court. Senate Committee on Ways and Means, Policy Report #13, pp. 23-5.

7. Roland Piggford, "Role of the Massachusetts Board of Library Commissioners in the Development of Multitype Library Networks and Resources Sharing Consortia: A Position Paper."

8. University of Massachusetts, Office of the President, Report of the Commission on Telecommunications.

provided through MCET, and originating programming to be used throughout the State via the MCET network. Third, MCET will develop and implement a teleconferencing capability. Librarians could utilize teleconferencing at several sites simultaneously for timely program or committee meetings and continuing education which could increase the number of participants and decrease the amount of travel necessary.

Planning Committees

In October 1981, staff members of the Board of Library Commissioners met with representatives of the Massachusetts Conference of Chief Librarians of Public Higher Education Institutions (MCCLPHEI) to discuss the implications of Policy Report #13. It was decided that a Joint BLC/MCCLPHEI Automation Planning Committee be formed to discuss automated resource sharing. By the middle of November, members were appointed. Representing MCCLPHEI were Richard Talbot, University of Massachusetts/Amherst, Joseph Kopycinski, University of Lowell, and Ben Hopkins, Massachusetts College of Art. BLC representatives included Gary Sorkin, who served as Chair, Mary Burgarella, and Robert Dugan. The Committee's charge was to design "a mechanism for the planned development of a computer-linked network of economically and politically viable systems to provide resource sharing among all types of libraries."

At the Committee's first meeting, members decided that Massachusetts librarians needed to be surveyed to learn their perceptions of priorities and needs related to resource sharing prior to holding a conference. During December, Robert Dugan designed a survey utilizing a modified Delphi technique employing a two-stage questionnaire. The first questionnaire was mailed to a survey population of 361 academic, public, and special libraries and library consortia.

The Joint BLC/MCCLPHEI Automation Planning Committee met again in February 1982 to discuss the findings of the first questionnaire and approve the second instrument. Committee members felt it was necessary to expand membership to include representatives from public, private academic, and special libraries. Objectives for the expanded and renamed Joint Automation Planning Committee would be:

1. to analyze and draw conclusions from the Delphi survey results concerning the needs and perceptions of librarians in the State with respect to library automation;

2. to develop mechanisms (i.e. task force, study committee, conference) which would provide a planning process and strategies for effectively meeting these needs; and

3. to serve as a Steering Committee in the writing and adoption of an appropriate planning document for multitype resource sharing.

New members added were Richard Gladstone of the Merrimack Valley Regional Planning Commission (also a member of the LSCA Advisory Council), Sherrie Bergman, Wheaton College, and Robert Maier, Bedford Free Public Library.

At its first meeting in March, the Joint Automation Planning Committee reviewed the results from the Delphi survey and established four task forces based upon the findings. Task forces would explore the present and potential level of development and cooperation in each of the findings

areas and formulate options for statewide planning purposes. A member of the Committee chaired the Task Forces on Union List of Serials, Resource Sharing, Automated Circulation Systems, and Network Planning. Reports were expected by July 1, 1982.

Only the Task Force on Resource Sharing, chaired by Sherrie Bergman, completed its work and submitted a formal report. The Task Force presented four alternative plans to link bibliographic systems in Massachusetts to permit resource sharing. No other reports were forthcoming from the other three task forces although all had met at least once.

In mid-August, the Joint Automation Planning Committee was called to meet by temporary Chair Robert Dugan because of Sorkin's departure from the BLC in June. Committee members agreed that it was time to develop a plan based upon telecommunication links between existing and future automated circulation systems, creating a resource sharing network. In addition, the plan would specify a mechanism responsible for evaluating the network and making recommendations for changes. A smaller, working group composed of library representatives from all types of libraries was considered the most appropriate vehicle for developing the plan.

As a result of the Joint Automation Planning Committee's decisions, a new working group, renamed the Automation Planning Committee (APC), convened in October 1982, charged with planning a multitype resource sharing network. Membership included:

Sherrie Bergman, Wheaton College
Jack Hall, Greater Lowell Regional Vocational School
Ben Hopkins, Massachusetts College of Art
Jane Katayama, MIT Lincoln Laboratory
Robert Maier, Bedford Free Public Library
Susan Björner, Board of Library Commissioners, Secretary
Robert Dugan, Board of Library Commissioners, Chair

The APC met regularly from late 1982 through mid-1983, designing a planning process, conducting surveys, and developing and approving this plan for submission to selected advisors and librarians and the LSCA Advisory Council for reactions and comments.

3. CURRENT LIBRARY AUTOMATION AND COOPERATIVE ACTIVITIES

In November 1982, the Massachusetts Board of Library Commissioners surveyed 1,400 libraries concerning their use of computers in various functions.[9] Questionnaires were sent to public, school, academic, and special libraries. Seven hundred seventy-eight libraries responded by February 1983. For purposes of analyzing the extent of automation, it was assumed that, for the most part, those libraries that did not respond had no automation projects to report. Two hundred eighty-two libraries (36.2% of the 778 respondents) **were** automated in some degree at the end of 1982 and an additional 105 (13.5%) indicated that they were planning some automation within the year.

Special libraries showed the greatest level of automation, with 63.3% of the 199 respondents indicating that they used computers in some way in their libraries. Almost as high was the **academic** group, showing 62.2% of 111 respondents using some automation.

Public and **school** libraries revealed much lower use of computers than did special and academic libraries. Two hundred seventy-two of the 381 public libraries in Massachusetts responded to the survey. Of the public libraries answering the survey, 23.9% indicated some level of automation. Only 21.6% of the 241 secondary-level school libraries responding said that they were computerized to some degree.

The library functions that have been automated vary greatly by type of library. **Cataloging** is the activity most frequently automated in academic and in public libraries (88.4% of the automated academic libraries are using computers in cataloging, while 70.8% of the automated public libraries are doing so). Cataloging is a high priority in special libraries as well, with 54.0% of the automated special libraries having computerized the cataloging process. However, cataloging falls way down on the priority list for automation in school libraries: only 9.6% of the school libraries that are automated have computerized cataloging.

School libraries, on the other hand, have given highest priority to providing computers for their **patrons' use** (55.8% of the automated school libraries have introduced computers for their patrons), a service that is lower on the priority spectrum in other types of libraries. Only 17.4% of academic, 16.9% of public, and 8.7% of special libraries which are automated provide computers for use by their patrons.

All types of libraries mention **word processing** as a computerized activity that is often implemented in their libraries. 48.1% of the school, and 43.1% of the public libraries that are automated mentioned that they use word processing for at least general office functions, if not for specific library activities. 44.4% of automated special libraries and 36.2% of automated academic libraries use word processing.

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9. Massachusetts Board of Library Commissioners, Computer Use in Massachusetts Libraries.

Word processing is followed often in all types of libraries by **management processes** (accounting and budgeting, statistical reports and planning, scheduling, and electronic mail) as functions that have been automated.

Circulation is an activity that public and school libraries have automated sooner than have academic and special libraries. Sixteen public libraries (24.6% of the automated public libraries) and 14 school libraries (26.9% of the automated school libraries) have computerized circulation systems, versus 13.0% of the academic libraries and only 6.3% of the special libraries.

Online searching of remote databases is another activity that shows a wide disparity in application between types of libraries. Fully 103 or 81.7% of the automated special libraries offer these search services, and academic libraries follow with 60.9% of those automated offering computerized literature searching. However, only 6.2% of the public libraries that have any computer use provide access to the national online databases, and a single school library (1.9%) uses computerized search services.

Statistics of computer use in all types of libraries can be expected to change rapidly as libraries proceed with their plans to automate. Two hundred sixty-eight of the libraries responding (34.4%) indicated that they will begin or extend automation within the year. 39.2% of these libraries currently report no use of computers at all. The others will be automating functions that were previously not automated or changing systems in functions that they have already reported as automated. 44.1% of the academic libraries will be starting or adding automation projects within the year; 39.2% of the special libraries will computerize; 34.4% of the school libraries, and only 27.2% of the public libraries show plans to automate.

Of libraries that are not currently automated, the rush to computerize is strongest among the schools. 30.2% of school libraries which do not now have computers will be purchasing or starting to use them within the year. 26.2% of the academic libraries not currently automated have plans to do so within a year, while 62.2% of the academic libraries already have some automation. Only 17.8% of the special libraries now without computer use will initiate computers within the year, but 63.3% of the special libraries responding already have some automation. Although 13.0% of the public libraries not currently automated also have plans to begin automation within the year, only 23.9% of all the public libraries responding are currently using computers.

A further check of the returned questionnaires indicates that 66 libraries of all types mention that they share in automation projects with 26 different consortia or cooperating groups. Some of the consortia have been in existence for a relatively long period and were originally formed not to automate library activities, but to promote cooperation in other areas. Other groups, such as C/W MARS (Central/Western Massachusetts Automated Resource Sharing), did establish automation projects congruent with or shortly after their formation. The costs of automation, the possibilities of expanding resources, and the desirability of sharing technical expertise support the likelihood of increased cooperative activity among libraries.

There are, of course, several examples of cooperation among Massachusetts librarians where automation is not a factor. In addition to the survey Computer Use In Massachusetts Libraries, information is provided

from a 1977 Bureau of Library Extension questionnaire and informal and internal reference files of the Board of Library Commissioners on some 35-40 consortia and cooperating library groups.[10] These cooperatives vary considerably in both size and makeup. Some memberships are made up of institutions of a single type, while others are composed of libraries of various types. Representative cooperating groups include the following:

Mostly ACADEMIC library members:

- MCCLPHEI (Massachusetts Conference of Chief Librarians of Public Higher Educational Institutions)
- Boston Library Consortium
- Fenway Library Consortium
- HILC (Hampshire Inter-Library Cooperative)
- WACL (Worcester Area Cooperating Libraries)
- CLGS (Cooperating Libraries of Greater Springfield)
- RLG (Research Libraries Group)

Mostly PUBLIC library members:

- EMRLS (Eastern Massachusetts Regional Library System)
- CMRLS (Central Massachusetts Regional Library System)
- WMRLS (Western Massachusetts Regional Library System)
- Merrimack Valley Library Cooperative
- Minuteman Library Network
- NOBLE (North of Boston Library Exchange)

Mostly SCHOOL library members:

- EDCO (Educational Collaborative, Greater Boston)
- MEC (Merrimack Educational Collaborative)

Mostly SPECIAL library members:

- Massachusetts Health Sciences Library Network
- AHECs (Area Health Education Centers)
- BBLC (Boston Biomedical Library Consortium)
- CMCHRL (Central Massachusetts Consortium of Health-Related Libraries)
- CIR (Consortium for Information Resources)
- NECHI (Northeastern Consortium for Health Information)
- Southeastern Massachusetts Health Sciences Libraries
- MIT Indusirial Liaison Program
- Boston Theological Institute
- Digital Library Network
- GTE Library Network
- Honeywell Information Network
- Route 128 Librarians Group

MULTITYPE COOPERATIVES

- CHIN (Community Health Information Network)

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10. Ibid., Linking Information Needs, p. 17.

- ECCL (Essex County Cooperating Libraries)
- MILC (Merrimack Inter-Library Cooperative)
- SMCL (Southeastern Massachusetts Cooperating Libraries)
- WELEXACOL (Wellesley-Lexington Area Cooperating Libraries)
- C/W MARS (Central/Western Massachusetts Automated Resource Sharing)

Cooperatives have traditionally formed among libraries of the same type. Similar needs and similar resources tend to draw institutions together. This sympathetic relationship is heightened if the institutions involved share geographic proximity.

Public libraries concentrate a major proportion of their activities on circulating book materials to their patrons. Not surprisingly, the major cooperative groups with high public library membership fall into one of two categories: 1) the state-funded Regional Public Library System, or 2) resource sharing collaboratives cooperating in the purchase and operation of computerized circulation systems.

Academic libraries traditionally have cooperated in interlibrary loan and the production of union lists. MCCLPHEI originated out of a joint purchasing effort entitled "Books for College Libraries" which lasted from 1969-1975. The Boston Library Consortium, Cooperating Libraries of Greater Springfield (CLGS), and Worcester Area Cooperating Libraries (WACL) all have a history of sharing their resources by participation in the organization of union lists of serial holdings.

School libraries have individually made efforts at cooperating with the public libraries of the communities in which they are situated. Other than this librarian-to-librarian contact, the school librarian often finds it difficult to transcend institutional barriers, but is often carried along in cooperative efforts by the parent institution through membership in a regional system or an educational collaborative.

Special libraries also have heavy institutional inhibitions to their cooperative efforts, but with their specialized collections they are heavily dependent on interlibrary loan activity for materials outside their mandated subject area. The health sciences libraries have a long-standing network, which was formed in response to a strong need for resource sharing and with the assistance of federal financial incentives. A similar subject orientation is evidenced in the grouping of member libraries into the Boston Theological Institute and the MIT Industrial Liaison Program.

Institutional orientation is obvious in the existence of intra-corporate networks such as the Digital Library Network, the GTE Library Network, and the Honeywell Information Network. Here, the combined resources of the corporation often overcome separate divisional budgets and interests, as well as a wide geographic area, to support informational networking within the institutional structure.

Special libraries are heavily dependent upon professional associations such as the Boston Chapter of the Special Libraries Association and the Route 128 Librarians Group for networking outside of their specialized institutions. Both of these groups have been influential in facilitating informal interlibrary loan arrangements among selected participants.

There are few genuine multitype consortia, that is, formal organizations with substantial representation of membership by two or more types of libraries. CHIN (the Community Health Information Network), including public and school libraries in its membership, is anchored by Mt. Auburn Hospital in an effort to disseminate health information to access points in its service area. SMCL (Southeastern Massachusetts Cooperating Libraries), comprised of four academic, two public, and one hospital library, publishes a computer-produced union list of serials and engages in shared reference service and interlibrary loan activity through a dedicated telephone line and a delivery system. The Essex County Cooperating Libraries (ECCL) and Merrimack Inter-Library Cooperative (MILC) are each representational of all four types of libraries. They meet regularly, confer on issues in common and work jointly on major projects, and charge an annual membership fee. WELEXACOL (Wellesley-Lexington Area Cooperating Libraries) has produced a union list of reference strengths reflective of its academic, special, and public membership. C/W MARS is embarked on the implementation of a circulation and interlibrary loan system for 28 academic, public, and special libraries in Central and Western Massachusetts.

In addition to state and regional cooperative activities, Massachusetts libraries are making increased use of national and even international networks operating as bibliographic utilities (such as OCLC - Online Computer Library Center) and online information retrieval systems. Ninety libraries reported use of OCLC at the end of 1982. One hundred and two search DIALOG and 46 search BRS (Bibliographic Retrieval Services, Inc.), while a smaller number use SDC Orbit, NYTIS (New York Times Information Service), Mead Data, and other database vendors. Support services, such as training and update sessions, user committees, and regular printed and electronic communications among members of these groups, provide another form of continuing cooperation among various types of libraries. Presently OCLC/NELINET use is highest among academic libraries, with additional representation from special and larger public libraries. Special libraries and academic libraries are the largest users of national online database vendors; there is very little use by public libraries and virtually none by school libraries.

Inter-type library cooperation often requires a greater commitment of effort and resources than intra-type cooperation. A respect by all participants for the differing missions and limitations of the other institutions is a prerequisite. Substantial amounts of staff time are needed for the education of direct participants in the cooperative effort and the indirect supporters and users of the cooperative effort within each institution. Additional time commitments and creative thinking are required for the solution of problems encountered in the process of cooperation. A strong desire to build on the strengths and surmount the weaknesses of individual institutions in order to meet all the information needs of the user is paramount.

4. OVERALL GOAL FOR MEETING NEEDS

In 1977 the Massachusetts Board of Library Commissioners, the Statewide LSCA Advisory Council on Libraries, and four task forces charged with identifying user needs developed an overall goal for libraries in the Commonwealth to meet those needs. The spirit and intention of this stated goal provides the necessary framework with which to begin the design of a resource sharing network:

> To provide every resident of Massachusetts with equal opportunity to access that part of the total information resource which will satisfy the individual's educational, occupational, cultural, and recreational needs and interests, regardless of the individual's location, socio-economic status, possible physical disability, or level of intellectual achievement.

5. USER AND LIBRARY NEEDS

People need information contributing to survival and success in living. They have always needed it, but now, in a complex society, the need is growing. Life information needs range from survival (general life maintenance - food, clothing, jobs, housing, personal care and safety, social and emotional integration) to self-enrichment and growth (information needs relating to recreation and leisure, education, and self-actualization).[11]

A New England study of information seeking patterns conducted in 1979 concluded that 73% of the information needs of people over 16 years old related to the theme of "meeting personal needs." Aspects included information to serve in coping with day to day problems, trauma, or crisis; news and current events; supporting interest in cultural heritage, religion, and family life; and accommodating needs in entertainment, recreation, and leisure activities. The only other theme to generate wide interest was "improving organizations and professions" including information to meet needs of the work place. Issues in the "enhancing lifelong learning" (support education in schools, erase illiteracy and improve reading skills of the public) and "effectively governing society" (increase citizen participation in public policy decisions, government needs for census, economic, and other related information) categories accounted for 7% of the people's information needs.[12]

The traditional, book-oriented library can no longer meet the information needs of its patrons. The distribution of knowledge and information relevant to all aspects of an individual's life span requires:

1. the ability to find the location of the information and/or material in a timely manner both within and beyond the local library collection, and
2. the receipt of the right amount of information and/or material in the most efficient mode possible once the individual's need is determined.[13]

Libraries are not a major supplier of information needs of citizens. The 1979 study previously mentioned discovered that New Englanders were most likely to draw upon "interpersonal sources" of information including personal experiences, friends, relations, and co-workers. Libraries were consulted as a possible source of information only 17% of the time when a need for information became evident. This meant that among institutional sources libraries ranked fourth behind businesses, professionals (doctors and lawyers), and government agencies and ahead only of social agencies and

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11. National Commission on Libraries and Information Science, pp. 254, 268.

12. Ching-chih Chen and Peter Hernon. Information Seeking: Assessing and Anticipating User Needs, p. 48.

13. Roderick G. Swartz. "Multitype Library Cooperative Response." p. 15.

religious leaders.[14]

Fifty-one percent of those responding in the Chen study who did not use libraries as a source of information stated that it was because they did not need libraries, did not think libraries could help, or had enough information from other sources. Another 10% said it did not occur to them to consult a library. Libraries were most often used as a source of information in situations dealing with consumer issues, getting/changing jobs, and education and schooling.[15]

Traditionally, libraries have been oriented more toward building their collections than toward using those collections to meet the specific needs of a person. In most cases, libraries have been geared to serve the "average user."[16]

Libraries have always reflected certain assumptions about users. Despite studies which have pointed out several factors to the contrary, library practices continue to reflect these same assumptions:

1. "Patrons will turn to the library when they need something"

   . . . From the New England study it is obvious that people infrequently (only 17% of the time) think of the library as a possible source for their information needs.

2. "They will be willing to wait for an item for varying amounts of time"

   . . . They are usually unwilling to wait for material and therefore do not even come to the library but consult someone they know and get what they need quickly.

3. "They know what they want"

   . . . They may know approximately what they want but do not always realize what is available to them in addition to the sources, usually "interpersonal," known to them. Thus, they can miss a wealth of pertinent information through lack of source identification.

4. "They are able to describe what they want adequately"

   . . . Probably not, as any reference librarian can relate.[17]

Recent reports and studies conducted in Massachusetts have noted a dramatic shift in perception on the part of librarians from "collection-

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14. Chen and Hernon, pp. 53-63.

15. Ibid., p. 97.

16. K. Leon Montgomery, "Library Resource Sharing Networks." p. 150.

17. Brigitte L. Kenney. "Network Services for ILL," pp. 128-9.

oriented, self-sufficiency" toward the need for expanding beyond the scope of the local collection and acquiring access to a wider range of materials through cooperative efforts, benefiting both user and librarian. As a document supporting the FY1982 budget recommendations of the Senate Committee on Ways and Means (Senate 2222, June 1981, Vol. II), entitled Policy Report 13: Libraries of the Massachusetts System of Higher Education, emphasized, the cost-effective nature of cooperative activities is envisioned as contributing to the development and utilization of a database of holdings of Massachusetts libraries in public higher education for access and resource sharing.

A subcommittee of the Automation Planning Committee conducted a survey in early 1983 of several special libraries in "high tech" and other fields to assess their information needs. When asked if the librarians used other libraries to meet their users' needs. 90% responded in the affirmative. Over 50% of the special librarians utilize an online bibliographic search-retrieval system. Obviously, the special libraries have a need for informational resources beyond their local collections to meet the needs of their users.

In late 1981 and early 1982 the Board of Library Commisssioners and the Massachusetts Conference of Chief Librarians of Public Higher Education Institutions (MCCLPHEI) assessed need priorities of public, academic. and special libraries and library consortia using a modified Delphi technique employing a two-stage questionnaire. The first questionnaire posed a general question to which participants could respond in whatever manner they chose. The 400+ responses were then grouped into categories. eliminating duplicates and those responses not amenable to numeric ranking. The remaining responses were then contextually reviewed. combined where possible, and finally reduced to a manageable 28. Participants then had the opportunity to rank the responses numerically from one to ten indicating their priorities. Rankings were statistically analyzed employing an arithmetic mean which yielded eight high priority areas:

RANK	MEAN (10 maximum)	NEED
1	8.09	Union list of serials on a statewide/ regional/local basis
2	7.60	On-line catalogs for resource sharing (interlibrary loan capability)
3	7.54	Support of capital costs for library participation in networks
4	7.26	Development of a statewide plan for library automation
5	7.12	Automated circulation systems on a statewide/regional/ local basis
6	7.00	Development of networks and interfaces among networks
7	6.94	Access to bibliographic utilities
8	6.78	Training/workshops on automation

The rankings indicate that librarians feel the need to share resources by

participating in cooperative activities and networks. Circulation systems can be the major tool of resource sharing with interfaces and communications between systems constituting a network.

6. OBJECTIVE TO THE OVERALL GOAL - RESOURCE SHARING

One of the objectives developed relating to the overall goal for meeting needs is concerned with resource sharing:

> Increase citizens' access to Massachusetts information resources by sharing resources as broadly and effectively as possible.

Librarians today acknowledge the impossibility of maintaining comprehensive collections and of providing totally comprehensive services to their users based upon their own resources.[18] A goal of resource sharing is to maximize the availability of materials and services and to minimize expenses. The emphasis is on access rather than possession.[19] Resource sharing arrangements among libraries provide the library user with access to resources beyond the local collection.[20]

The sharing of collections among libraries of one type cannot meet the needs of the total community because users need information from more than a single-type collection. Therefore, resource sharing among various libraries will broaden the scope of resources from which to meet the users' needs.

Resource sharing activities are increasing because of four trends:

- the goals of library services are shifting from collection-oriented to user-oriented;
- fiscal concerns are limiting the self-sufficiency of libraries;
- studies have advanced our understanding of use of materials; and
- technology is more accessible and responsive to library needs.[21]

Libraries strive toward self-sufficiency to meet the demands from users that materials be available on-site and immediately. However, several factors limit self-sufficiency. First, financial limitations impede building a comprehensive local collection. Second, libraries often lack the physical space for such an effort. Finally, there may be a lack of expertise in developing and evaluating the collection.[22]

Libraries are becoming increasingly expensive and declining in cost-effectiveness at a time when users are demanding greater efficiency. The

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18. Alice Wilcox, "Academic Library Participation in Networks," p. 168.

19. Allen Kent, "The Goals of Resource Sharing," p. 26.

20. Danuta A. Nitecki, "Online Services," p. 7.

21. Thomas J. Galvin and Marcy Murphy, "Progress Towards Goals in Library Resource Sharing," p. 80.

22. Richard E. Chapin, "Limits of Local Self-Sufficiency," pp. 57-8.

cost-effectiveness criterion means that output must increase or improve with relatively constant levels of funding or it must remain constant at reduced levels of funding. The costs of library operations have risen rapidly in recent years resulting in higher costs per unit of output and lower labor productivity. The prices of library inputs, that is, books, journals, and labor, have increased more rapidly than prices generally.[23]

The rising costs of acquisitions will necessitate an increased level of sharing. For example, the average hardcover book price in the United States has increased by 32% from $19.30 in 1978 to $25.48 in 1981.[24] Average prices for annual journal subscriptions rose even more dramatically, from $27.58 in 1978 to $44.80 in 1982, an increase of 70% in five years.[25] During the corresponding period, public library materials expenditures in Massachusetts increased only 8%.[26] Therefore, libraries could not keep pace and necessarily acquired fewer titles. A review of budgets of all types of libraries, if available, would show a similar trend because of the spiralling cost of materials.

Resource sharing is increasing as librarians cope with constraints on self-sufficiency to meet user needs. For example, there was a 60% increase in interlibrary loan nationwide between 1974 and 1977, the last period for which statistics are available.[27] The availability of materials which resource sharing seeks to maximize requires trade-offs of time and accustomed ways of utilizing library materials. With interlibrary loan, there is a delay in obtaining a particular item because it is not held locally; however, the money saved from that non-acquisition represents an investment in accessibility to more materials than the local library can afford. The cost-effectiveness of resource sharing is diminished, however, because the effort toward the sharing of resources has to run concurrently with the trend of some libraries attempting self-sufficiency.[28]

A decision to cooperate in a resource sharing effort should be based on two criteria. First, potential members must acknowledge that they have common interests and could achieve higher levels of service and efficiency by working cooperatively. Second, potential members must be willing to commit the necessary financial and philosophical support on a continuing basis.[29]

Interlibrary loan has never been free. It only appeared that way because money was not changing hands in the transaction between borrower

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23. Miriam A. Drake, "Economics of Library Networks," pp. 221-2.

24. Joanne O'Hare and Betty Sun, eds., Bowker Annual, p. 388.

25. Norman B. Brown and Jane Phillips. "Price Indexes for 1982: U. S. Periodicals and Serials Services." p. 1380.

26. Massachusetts Board of Library Commissioners, Data for Massachusetts: Comparative Public Library Report FY82.

27. O'Hare and Sun. pp. 334-5.

28. Kent, "The Goals of Resource Sharing." p. 27.

29. Ruth J. Patrick, Guidelines for Library Cooperation, p. 47.

and lender. Although resource sharing can result in access to more materials, it highlights personnel, materials, and other costs previously ignored or minimized, creating a new set of problems that must, and can, be solved.[30]

30. William DeJohn. "Public Library Cooperation as Seen From a Multitype Network," p. 72.

7. NETWORKS - THE MECHANISM TO RESOURCE SHARING

In its simplest definition, a library network is a mechanism which facilitates the sharing of resources among libraries for the mutual benefit of their clienteles. A library network exists when two or more libraries formally engage in a common pattern of information exchange, through communications, for some functionally interdependent purpose.[31] Networks are more formally organized than resource sharing cooperatives and dependent upon an established system of communication.

Network functions fall into three primary classes:

1. those that serve the patron directly;
2. those that serve the member libraries directly and the patron indirectly; and
3. those that support the network structure.

The first two classes are goal-oriented in that they attempt to fulfill the primary goal of the network (service to the patron) and its necessary condition (survival of the library). The third class is means-oriented in that it consists of activities that contribute to the accomplishment of the other two functions.[32]

The goals of networking reflect those of resource sharing - increased access and reducing or controlling the rate of rising costs. Objectives of a network can be summarized briefly:

1. shared access to collections (through expanded interlibrary loan and borrowing privileges);
2. coordinated collection development to avoid unnecessary duplication of materials;
3. shared access to bibliographic data; and
4. continuing education and development of technical expertise of staff members.[33]

Essentially, resource sharing networks are established to provide collectively three activities related to the goals of increased access and cost-effectiveness:[34]

1. **Search Services**

   Commonly referred to as database searching or information retrieval, search services involve the process of finding data or information in remote files. Created from a variety of sources

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31. Joseph Becker. "Network Functions: Reactions," p. 88.

32. Andrew Leddes. "Public Libraries in Local Cooperative Systems," p. 51.

33. Genevieve M. Casey. "Cooperation Networking." p. 460.

34. Hank Epstein. "Technology of Library and Information Networks." p. 425.

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including legal, medical, consumer, business, and other subject areas, database files are collections of text and/or numeric data in machine-readable form provided by organizations such as Systems Development Corporation (SDC Orbit), Bibliographic Retrieval Services (BRS), and Lockheed (DIALOG) and stored electronically for access by remote users via telecommunications. Searchers use a variety of computer devices (such as "dumb terminals" or microcomputers), and telecommunications equipment (such as acoustic couplers or modems), to access and search the database files compiled by these vendor organizations on host computers sometimes thousands of miles away.

There are essentially two types of databases. **Bibliographic** database files contain reference or secondary information covering a number of years, and provide searchers with citations to journals, serials, research reports, specifications, or other sources of information. Bibliographic databases do not provide complete information but identify sources of information for the searcher to peruse. Several files contain abstracts with the citations, providing more but still limited information about the source. These databases are usually accessed by librarians and information professionals. **Source** or **nonbibliographic** databases may include statistic and other numeric data or the full text of the document, such as LEXIS (legal materials) or NEXIS (business materials). These nonbibliographic databases are often accessed by end users rather than intermediaries such as librarians.[35] Recently, databases were made available to the general consumer which provide a variety of information sources including transportation schedules, current news stories from UPI, or items for sale, (an "electronic mail order catalog").

Advantages of search services include:[36]

a. speed - online searching is much faster than manual searching.
b. comprehensiveness - the online searcher has access to many more information sources than even the largest of libraries can support in printed form. In addition, there are increasing numbers of databases available online which are produced only in machine-readable form and which have no printed equivalent.
c. currentness- online information sources are often updated monthly, biweekly, or weekly before their published counterparts are printed and distributed.
d. flexibility - the interactive nature of online searching permits many more access points than manual searching allows. One of the most powerful advantages is the capability of the searcher to query the database by a variety of entries: subject, title, author, sponsoring organization, date of publication, and to use Boolean logic, combining search words with the logical operators ("and," "or," and "not"). The searcher has immediate feedback on the relevance of a search and may alter the profile or strategy at any point to increase relevance.

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35. Ryan E. Hoover, "Overview of Online Information Retrieval." p. 18.

36. Ibid., p. 19.

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2. **Cataloging/ILL Services**

Cataloging services provide bibliographic citations, through cataloging "utilities" or "networks" (vendors such as OCLC) for users to search, modify, add to, or replace in the database. The database providers incorporate standards in record format and content to ensure record consistency and file compatibility. End products from the file include catalog cards and computer tapes of machine-readable bibliographic records.

Records are created in machine-readable form, indicating that a library owns the item. Access to files of records with holdings information, either through a cataloging utility or through a database file located on a circulation control system, will facilitate interlibrary loan.

Libraries which have converted their records into machine-readable form using a cataloging utility or service may have their file of records copied from the database onto computer tape. The tape can then be loaded onto an automated circulation control system, facilitating the process of conversion from a manual to an automated system.

Another advantage provided by some cataloging networks is the use of the ordering/acquisitions system. Using the same type of record as the cataloging file, the acquisition record may be used for cooperative collection development purposes by a group of libraries. The library may then use this record as the basis of the cataloging record, thus decreasing the need to retype the record information.

3. **Circulation/ILL Services**

Circulation services. offered by such companies as CLSI, Data-phase, and GEAC, provide optimal interlibrary loan services since the file not only includes location information but also availability status. End products include the current circulation status of library materials.

Some networks could be characterized as a single-type cooperative network, meaning that they serve a single type of library. The argument in favor of multitype library networks over single-type networks is convincing. Among the many benefits derived from participating in multitype networks are:

1. access to information about bibliographic resources in other types of libraries;

2. increased access and increased confidence in the availability of resources held in other types of collections in the network which enables libraries to gain increased flexibility in the spending of their book and journal funds;

3. access to highly specialized and general collections to broaden locally-held resources;

4. reference searches on databases that are capable of providing relevant abstracts and/or full

document text;

5. the capability of sharing services such as cataloging and ordering of materials; and

6. increased access to human resources. such as subject specialists. general information specialists, and school librarians who have the opportunity to train future users of libraries and information services.[37]

Multitype library networks should also consider other information providers outside of the institutional setting such as information brokers and other information professionals.[38]

Library networks must have a positive impact on users in terms of access to more materials. The network should also enable an individual library to provide a corresponding level of service at less cost, increased service at commensurate cost, or much more service at less cost than if the services were undertaken individually.[39] The effectiveness of resource sharing depends upon the availability of appropriate communications, technology, and delivery systems.[40] To be minimally effective. a library network must:

1. provide library service to at least as many users via the network as were served by each individual library prior to the network;

2. fulfill at least as many requests for library materials via the network as were met by each individual library prior to the network;

3. provide bibliographic access to library resources at least as rapidly as conventional location devices such as local card catalogs;

4. offer access to a larger collection of materials than is available at any one of the libraries in the network;

5. provide delivery of materials borrowed via the network within a specified amount of time (determined by members) in a majority of network loans.[41]

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37. Mary Ann Roman and Heather Day. "The Role of the Special Library in Networking," p. 301; Richard DeGennaro, "The Role of the Academic Library in Networking," p. 306; and Richard Sorensen, "The Place of School Libraries/Media Centers in Library Networks." pp. 310-13.

38. Ching-chih Chen and Peter Hernon, Criteria of Effectiveness for Network Delivery of Citizen Information through Libraries, p. 9.

39. Kent. "Directions for the Future," p. 323.

40. Kent, "The Goals of Resource Sharing in Libraries." p. 27.

41. Montgomery. p. 137.

8. BARRIERS TO NETWORKING

Although networking is a viable means of resource sharing, many barriers persist. A typology of barriers has been developed by Orin Nolting which is applicable to all types of libraries.[42] Although dated, Nolting's typology provides a useful framework for discussing barriers.

Psychological barriers are reflected in attitudes or fears that are held by some librarians and some library planning/funding authorities. One such attitude is that of complacency, evident when librarians express satisfaction with the service they offer and thus exhibit no need to cooperate.[43] One fear is that participation in a network will alert library funders to the rich resources available elsewhere, raise unrealistic expectations for cost savings, and thereby result in reductions of budgetary support for the library.[44] However, the tradition of local autonomy has been cited as the greatest, single barrier to cooperation.[45] A library may know it cannot succeed by itself, yet it is afraid of losing its identity by becoming part of a larger resource sharing activity.[46] It is feared that participation will cause a library to give up some of its decision-making and management prerogatives, particularly in operating procedures, collection policies, service priorities, and budget flexibility.[47]

A second set of barriers stems from the lack of information and experience about user needs and the functions of libraries and services; the failure of smaller libraries to realize the value of larger libraries' resources; and unawareness of successful cooperative efforts. One of the most frequently cited barriers is the unpredictability of demands on the library by its primary users. For example, students and teachers have an "immediacy of needs" for materials that inhibits schools from lending resources. Librarians do not want to deal with users who do not look kindly upon discovering that the materials they want are out on loan to another library.[48]

Tradition and history operate as constraints to resource sharing because of the human tendency to maintain the status quo and because of past experiences with funding, collection overuse, and the limitations of access to academic and special libraries. For example, there is preference by all types of libraries to cooperate first with libraries of the same type, thereby limiting multitype cooperation. One reason for this is that

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42. Orin Nolting, Mobilizing Total Library Resources for Effective Service, pp. 6-10.

43. Edward G. Strable, "The Illinois Experience," p. 142.

44. DeGennaro, pp. 306-7.

45. Casey. p. 448.

46. John Fetterman. "Resource Sharing in Libraries - Why?" p. 5.

47. Roman and Day, pp. 301-2; and DeGennaro, pp. 306-7.

48. Anne Marie Falsone, "Participation of School Libraries." p. 133.

libraries are reluctant to become dependent on a fragile network organization where compromise is needed to deal with the diversity of libraries participating.[49] Traditionally, special libraries have limited access because their collections consist largely of confidential and proprietary information that cannot be shared.[50] Undoubtedly, one of the greatest constraints is the historically low funding levels of libraries. The major problem will be to find the funds necessary for capital investment and ongoing operations.[51] Many libraries currently do not include funds specifically for cooperative activities. Another major barrier is that most librarians and library boards have a natural fear of their own collections being depleted by heavy use from other libraries.[52] They believe hordes will descend upon materials which were originally intended to be used by a limited clientele, or that their libraries will be overwhelmed with interlibrary loan requests.[53]

Geographic constraints and the physical limitations of the library present another set of barriers. Distance between libraries, and between libraries and users, affects speed and quality of service, and in many instances determines or strongly influences the size and composition of the cooperative's membership.[54] Library hours may limit participation, as does physical space, particularly if the libraries are incapable of accommodating resources, staff, and users. A limited collection also hampers cooperation. For example, school collections are chosen to support the curriculum, and therefore a school library may not be capable of making a large contribution in materials to the resource sharing activity.[55]

Legal and administrative constraints present a further set of barriers to interlibrary cooperation. Administrative limitations include jurisdictional issues based upon laws and regulations. Often it is unclear whether a library can participate in a network because of its legal status. Additionally, some regulations restrict the use of federally-funded materials to certain target groups, removing resources from sharing.[56] A library manager may be reluctant to become involved in interlibrary cooperation because of the substantial commitment of staff time to the effort.[57] Other administrative and legal issues concern the classes of resources to be obligated (time, funds, materials, etc.), provision of data privacy, copyright, and reporting requirements for network activities.

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49. DeGennaro, pp. 306-7.

50. Strable, p. 142.

51. Drake, p. 224.

52. Mary Jordan Coe, "Indiana Case Study 2," p. 77.

53. Roman and Day, pp. 301-2; and Hamilton, p. 456.

54. W. Boyd Rayward, "The Local Node," p. 64.

55. Falsone, p. 133.

56. Sorensen, "The Place of School Libraries," pp. 314-8.

57. DeGennaro, pp. 306-7.

Another major set of barriers, not adequately discussed by Nolting, includes technical incompatibilities and uncertainties. There are many barriers to achieving optimum systems of communications, including technical advances yet to be achieved and the lack of standardization.[58] Not all libraries belong to the same bibliographic/cataloging utility, which inhibits automated resource sharing, since the links between systems hinge on the format and contents of the bibliographic record. The result is that librarians essentially speak different languages.[59] Additionally, libraries are reluctant to participate in cooperatives because rapidly accelerating advances in computer and communications technology may make some network systems obsolete in the near future.[60]

Most barriers can be overcome. Administrators must begin to think about library cooperation as a group of libraries working together, with the local library remaining the focal service point. They will not be giving away anything by resource sharing; rather, they will be becoming more responsible to users and funders. It is more a change of attitude than anything else.[61]

Specific barriers can be eliminated through communication to promote awareness and understanding. Autonomy can be protected through legal processes including statutes and contracts. Nowhere has any library been taken over by a network and nowhere will it occur.[62] The ability to demonstrate to funding sources how much better their constituencies can be served by being able to connect with a growing range of resources will help to secure the necessary funding.[63] The concern expressed by many librarians and trustees that they would be overwhelmed by requests for materials does not appear to be borne out. This is because the number of active participants has increased, resulting in a spreading of the request and lending burden.[64] Overuse of collections by external users can be handled with assurances (bylaws, agreements, etc.) that a participating library always has first call on its own materials and that the entire logic of a cooperative is to share resources rather than to rely totally on

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58. Donald W. King, "Some Comments on 'The Impact of Technology on Library Networks,'" p. 147.

59. Dorothy W. Russell. "Interlibrary Loan in a Network Environment," p. 22.

60. DeGennaro, pp. 306-7.

61. Alphonse F. Trezza. "Toward a National Cooperative Library and Informational Science Network," p. 161.

62. Ibid., p. 162.

63. Eva R. Brown, "Major Barriers to Interlibrary Cooperation," p. 437.

64. Noelene P. Martin. "Interlibrary Loan and Resource Sharing." p. 103.

one library.[65] Cost recovery/reimbursement fees for lenders of materials can be negotiated through network agreements or contracts. Technical and cooperative agreements, governance structures and policies. and applicable standards can provide a basis for solving most of the legal, administrative, and technical barriers which arise when establishing interlibrary cooperatives, particularly in utilizing automated technologies.

There exists a willingness on the part of many libraries to cooperate. as documented through the Delphi study conducted recently by the Massachusetts Board of Library Commissioners. Planning the design of an automated resource sharing network in this State requires careful consideration of the many existing barriers with the intent to resolve them.

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65. Coe, p. 77.

9. AUTOMATED NETWORKING

The computer's role in networking for resource sharing is one of mediation between the need on one hand to economize, and the need on the other hand to expand services in light of ever-increasing demands from the users.[66] While networks provide a mechanism for resource sharing, applying automated technologies to a resource sharing network will increase the network's efficiency and cost-effectiveness. The term "automated network" refers to both the organizations and the systems which link libraries together via telecommunications with computer-controlled message switching and database access. The "network organization" is the administrative/human aspect of networking, while "network system" denotes the necessary hardware and software.[67] A "network utility" is an entity using network systems to provide computer services to network organizations.[68]

The primary reason to utilize automation for resource sharing is that computers provide the necessary processing capabilities required for effective and efficient retrieval in terms of response time, storage capacity, and the necessary linkage and switching between components.[69] Problems of information access are alleviated and the speed in receiving information is improved when computer and telecommunications technologies are employed.

Besides utilizing a computer's processing power to increase the scope and space of access, the benefits of an individual library's participation in computer-based library networking are related to reductions in unit of cost which result from economies of scale. Economies of scale are the reductions in unit cost that result from increasing productivity.[70] Libraries are becoming increasingly labor intensive. It is unlikely that this increase in the proportion of labor will be matched by increases in labor productivity.[71]

The lack of increase in labor productivity results from the increasing costs to maintain growing collections and the inability or unwillingness to use labor-saving devices. In order to improve the relationship between library inputs (materials, labor, etc.) and output (productivity),

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66. Richard M. Kesner. "The Computer and the Library Environment," p. 40.

67. Neal K. Kaske and Nancy P. Sanders. "Networking and the Electronic Library," p. 66.

68. Susan K. Martin, Library Networks, p. 3.

69. James G. Williams, "Performance Criteria and Evaluation," p. 228.

70. Drake, p. 226.

71. Ibid., p. 222.

libraries will have to utilize computers and faster and cheaper means of telecommunications. The costs of processing library materials and collections and catalog maintenance will have to be reduced to supply resources for more responsive public service.[72] Applying automated technologies to the sharing of resources can improve both the efficiency and effectiveness of inputs and outputs.

Many libraries are too small to take advantage of economies of scale and too poor to invest in advanced technologies by themselves. Therefore, libraries should pool their resources by forming and participating in networks and share in the development and use of sophisticated online computer technology. This cooperation would permit rapid and effective resource sharing rather than having individual libraries undertake the full burden of development and operational costs alone.[73]

Computer and telecommunications technologies may be efficiently and effectively utilized to conduct network activities (search, cataloging/ILL, and circulation/ILL services) that increase access for library resource sharing. For example, terminals may be used to communicate with information retrieval systems to produce bibliographic citations or to access bibliographic databases (such as OCLC), to create cataloging records or a holdings file, or to ascertain which libraries own a requested item. One of the most powerful automated resource sharing tools is a network online circulation control system. Its many benefits include:

1. Increased access and speed of retrieval. It is possible for an individual to search the holdings of several libraries very quickly, determine the item's physical location, and immediately know its availability status (on the shelf, in circulation, on reserve, etc.). Location and availability information save personnel time and costs because librarians know where the item is and whether it is available (rather than sending through an interlibrary loan request hoping that the item is owned, and if owned, available for loan).

2. Cooperative collection development and maintenance. Duplication of low priority materials can be reduced; collection development by subject can be assigned to members; user demand and patterns of borrowing statistics can be generated for analysis; and individual library responsibilities for maintaining unique resources can be decided.

3. Simplifying the distribution of lending loads; thereby enabling the system to become a more equitable proposition for the lending libraries.[74]

The technical ability to be instantly aware of the location, as well

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72. Ibid., pp. 223-5.

73. Ibid., p. 225; and DeGennaro, p. 306.

74. Boals, p. 125; and Niteckl. "Impact of an Online Circulation System on Interlibrary Services." pp. 10-1.

as the current availability, of needed items in a cost-efficient and effective manner will significantly increase the viability of resource sharing.[75]

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75. Nitecki. Ibid., p. 10.

10. AUTOMATED LIBRARY NETWORKING IN MASSACHUSETTS
MISSION STATEMENT

After exploring the issues of needs assessments, resource sharing, networks, barriers to networking, and the role of automation in networking, a mission statement for developing an automated resource sharing library network in Massachusetts is necessary to serve as a framework for network activities:

MISSION

Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

1. develop and link databases to provide greater access opportunities to resources;

2. develop document request and delivery procedures; and

3. develop a program of computer literacy/training for librarians without direct access to computerized network systems.

11. PRINCIPLES EMPLOYED IN DESIGNING THE RESOURCE SHARING NETWORK

These principles are considered the basic attributes of a resource sharing network in Massachusetts:

1. Each individual has the right to access the information that meets his or her needs.

2. All network services should be provided at a level of operation as close to the user as possible. A local library should be the user's most efficient and appropriate service center. Therefore, network services should be provided through libraries as often as possible. The network must support local libraries, not compete with them.[76]

3. The objectives of the resource sharing network should be realized without harm to the missions of participating libraries, although their methods of operation invariably must be adjusted.[77] All libraries have a responsibility to collect the materials needed regularly by their own constituents.[78] Resource sharing is not a substitute for local acquisition, only a supplement.

4. It is essential that the network enable individual libraries to maximize the gains of resource sharing while allowing for local flexibility; network members must understand and recognize existing individual constraints.[79]

5. The resource sharing network should be built upon existing cooperative systems and existing library strengths. New resource sharing systems, built upon strong individual library collections and services, should evolve where existing cooperatives are no longer effective. The network should not compete with existing arrangements, but rather improve, redirect, and extend those already existing, and offer alternative approaches which will prove more valuable and useful.[80]

6. Networking is not free. Besides equipment and material costs, staff time is necessary to provide shared services.[81] Therefore, each participant must be able to balance benefits with investment. This balance need not be measured solely in the traditional interlibrary loan concept of

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76. Wilcox, p. 168.

77. Kent, "Network Anatomy and Network Objectives." p. 13.

78. Noelene P. Martin, "Interlibrary Loan and Resource Sharing," p. 101.

79. Wilcox, p. 168.

80. EDUCOM. Agricultural Sciences Information Network Development Plan, p. 38.

81. W. Lyle Eberhart, "Public Library Networking Viewed from a State Library Agency," p. 61.

net borrowing versus net lending of materials.[82] Attention also must be given to the increased benefits of improved access to more resources. A cost-benefit analysis is an appropriate methodology to study the benefits of network investment.

7. The financial and fiscal basis of the continued operation of network components must depend upon local rather than federal, state, and private funding sources. Local funding sources include assessed membership fees, cost recovery/reimbursement fees, and allocations from the institutions. Governmental and private grants and intermittent local fundraising are unreliable as a financial base since they are more apt to change annually.

8. Resource sharing efforts must not be limited to within the State. When and where economically, technically, and politically feasible and desirable, the State's resource sharing network and its related services should overcome geo-political boundaries, broadening access into the total information resources of the region and the nation.

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82. Nitecki, "Impact of an Online Circulation System." pp. 10-1.

12. NETWORK STRUCTURE

Considering the mission statement of automated resource sharing networking and the aforementioned principles to be utilized in designing a network, the library network concept for Massachusetts is based upon the linking by telecommunications of independent cooperative systems of libraries, each with a center that not only coordinates the internal activities of the system, but also serves as the cooperative's link with the center of other systems. The network is hierarchical in that cooperative centers communicate with other centers in a planned outward and upward process. For users, this resource sharing network, with its local basis and hierarchical expansion process, can provide access to the full scope of information resources to meet their needs.

The network is designed to increase access to resources based upon a decentralized structure composed of independent cooperative systems of several types telecommunicating with other cooperatives to locate needed material (documents and/or bibliographic citations), ascertain availability status (if technologically feasible) and place requests for the desired items. Material is delivered in the conventional manner, that is, by mail or truck, although telefacsimile and digital transmission or other electronic means are future considerations, dependent upon technology, costs, effectiveness, and need.

1.0 Develop and link bibliographic databases to provide greater access opportunities to resources

The basis of automated resource sharing is the ability to create machine-readable records containing information, and the capability of others to access the database file. This activity is primarily concerned with developing access points into the various types of database files to increase the capacity for resource sharing, and linking the access points to each other. Another aspect of this activity is the development of interfaces between cataloging/ILL services and circulation/ILL services to increase efficiency.

Database files are accessed for resource sharing by three services:

- **search services** - database files which provide the searcher with bibliographic citations and/or abstracts of resources indexed in the database, or full document text, such as articles, transportation schedules, or current news stories.
- **cataloging/ILL services** - database files of shared machine-readable bibliographic records which are created by libraries during the cataloging process and which indicate library ownership; these files may be searched for interlibrary loan purposes.
- **circulation/ILL services** - database files of machine-readable bibliographic records which not only indicate ownership but also current availability (on the shelf and available for loan, in circulation, or on the shelf for reference use) to the requester.

1.1 Develop access points into the information resource

Many libraries in Massachusetts have computer and telecommunications technologies which give them the capability to access informational resources via search, cataloging/ILL, or circulation/ILL services. Increasing the number of libraries of all types participating in these services will increase the number of access points into the information resources, thus facilitating the sharing of resources between libraries for the benefit of the user.

1.1.1 Expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed

Resource sharing is best facilitated by utilizing online circulation control systems. Inclusion of the physical location and immediate availability status of the desired item in the accessed database file considerably reduces personnel effort in requesting interlibrary loan.

Circulation control systems are either stand-alone systems or network clusters. Stand-alone systems are owned by a single institution, while network clusters are shared by a group of libraries such as NOBLE and C/W MARS. Whether or not the circu-

lation control system is shared or stand-alone, it will be referred to as a **circulation/ILL cluster** or simply a **cluster.**

Because of the importance of circulation/ILL clusters in facilitating resource sharing, existing clusters should be expanded in size and scope to include more libraries as participants when and where it is feasible, considering hardware, software, and other factors. Building on existing clusters broadens the database files by increasing the number of resources accessible for sharing and also increasing the number of access points into the shared database file. Furthermore, expanding existing clusters saves costs by requiring only marginal increases in network systems while distributing the operational cost burden among more participants.

Several factors seem to be most influential in determining the scope of participation in a cluster:

1. population density of the area served;
2. types of libraries participating;
3. document delivery systems in place or feasible;
4. past and current cooperative efforts of participants;
5. patterns of clientele use and their needs;
6. types of network services offered by the system; and
7. funding available for ongoing operations (telecommunications is probably the most variable cost: the farther in distance the participant is from the computer, the higher the costs for telecommunications will be).

Smaller, geographically unified clusters can provide faster reaction and better service than is presently possible within larger clusters.[83]

When it is not feasible to include more participants in existing clusters, new, shared, online circulation clusters should be encouraged and developed.

1.1.2 Develop Information Network Centers (INCs) to serve as access points

Many public, academic, special, and school libraries do not currently participate in a circulation/ILL cluster and may not be able to in the near future for a variety of reasons. Also, these libraries may lack the means to access search and cataloging/ILL services for resource sharing purposes. Additionally, many clusters do not have libraries in their membership which possess the means to access other information resources provided by search and cataloging/ILL activities.

Residents need information, and access to the information resources is of primary importance. The means to access information resources should be available to all users and libraries by

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83. William B. Ernst, Jr., "Potential for Growth in Multitype Library Cooperation," p. 180.

a local library within a reasonable traveling distance of the user. Therefore, access points to the resources provided by search, cataloging/ILL, and circulation/ILL activities called **Information Network Centers (INCs)** should be developed. INCs are a cooperative effort of two or more local libraries (of the same or different types) in which one library houses the appropriate equipment and serves as the access point for the public and for other librarians that are members of the INC.

The primary responsibility of an INC will be to provide access into sources of information for resource sharing:

1. **search services**
   INCs will be capable of accessing information retrieval systems for bibliographical citations, abstracts, and full document text.

2. **cataloging/ILL services**
   INCs will create machine-readable records of the acquisitions of the member libraries by using an appropriate cataloging service. These records, which provide the physical location (ownership) of holdings, must then be placed in an automated system so that they can be accessed for resource sharing by other access points. In this way, materials in INC libraries are made available for interlibrary loan to other libraries, thereby expanding the State's resource sharing efforts.

3. **circulation/ILL services**
   INCs will have the capability of dial-up access to those clusters participating in the network for location information and, if possible, availability status.

INCs will be able to use any existing document request and/or delivery system, and to explore new methods when feasible.

INCs will possess the appropriate equipment for providing dial-up capability for search, cataloging/ILL, and circulation/ILL services. A microcomputer and modem with dial-up capability (300-1200 baud rate) and the necessary software will serve as the primary access tool for these services. Other hardware and software (a particular terminal, etc.) may be necessary for accessing one or more of the services.

Criteria for an INC will include that:

1. it must be in a library open to users and librarians;
2. it must be an ongoing, cooperative effort of at least two libraries (of the same or different types);
3. it must provide access to search, cataloging/ILL, and circulation/ILL services;

4. It must have initial acceptance by search, cataloging/ILL, and circulation/ILL services and participants;
5. It must document the need of users and the need and willingness of librarians to participate;
6. It must demonstrate that it possesses sufficient personnel and other resources within the INC membership to support continued operations; and
7. It must share its resources with other libraries.

Sites for INCs will be distributed considering geography, population, and user needs. Start-up and first year's implementation costs will be provided to the INC through grants, depending upon funding available and on a competitive basis. Ongoing operation of an INC must be funded through local arrangements, such as sharing costs with other libraries in the INC, reimbursement fees, and the like.

1.2 Develop telecommunications linkages between access points

The automated resource sharing network for Massachusetts is based upon telecommunications links between access points and with resource sharing search, cataloging/ILL, and circulation/ILL services.

Two types of telecommunications links will initially be used, both based upon analog and digital telephone lines. "Online" refers to a telecommunications link utilizing dedicated (sole-purpose) telephone lines and modems between access point hardware (e.g., terminal or microcomputer) and a computer which directly or indirectly provides the service. The link is always "on," that is, directly connected to and under the control of the central processing unit of a computer. Because the telephone line is "dedicated," the telephone company charges a monthly rate based on the number of lines and the distance between the access point and the computer. Although this type of link is very expensive, it is usually less expensive than dial-up access, and it is probably necessary if the link is extensively used.

"Dial-up" refers to a telecommunications link that does not depend upon a dedicated line. Although a modem is often used for the telecommunications connection, an acoustic coupler can also be used. Couplers are not acceptable for online links and not recommended for dial-up connections. The technological parameters of the service-providing computer will determine whether or not the link may be online or dial-up.

Telecommunications links between access points requires discussion.

1. among members within a circulation/ILL cluster

   Because members will be participating in a cluster to provide for their local circulation control needs (circulation, reserves, etc.) as well as resource sharing, the telecommunications link will be online (dedicated) from a remote terminal to the computer. Modems with at least 1200 baud capacity and multiplexers, which reduce the number of dedicated lines between remote and central sites, are recommended to reduce telecommunications costs.

2. between circulation/ILL clusters

The telecommunciations linkages between clusters provide the most effective approach to automated resource sharing because the desired link is one that can provide both the physical location and availability status of the needed item. With this complete information, interlibrary loan processing will be very productive since libraries will receive, for the most part, only loan requests they can immediately satisfy.[84]

Linking databases via telecommunications to permit resource sharing was considered the most viable alternative of those studied by the Joint Automation Planning Committee's Task Force on Resource Sharing. Developing a statewide, monolithic database of bibliographic records, while technically feasible, is prohibitively expensive. The need for statewide holdings information is far outweighed by the cost of establishing such a database.

All clusters should be willing to provide at least three ports on their computer for use by other access points for resource sharing. At least one of the three ports should be provided for dial-up access; the other two ports could be utilized for either online (dedicated) or additional dial-up links. Cooperating library groups receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with the central site circulation/ILL control system or equipment upgrade **must** provide at least five percent of their ports, but not fewer than three ports, for telecommunications links from other access points in the State. To facilitate resource sharing, all clusters should provide toll-free lines for the minimum dial-up port.

Technically, linkages between two clusters using the same vendor's computer system should be direct without the need for any substantive systems/telecommunications hardware or software development.

Both dial-up and online (dedicated) links should be possible and capable of providing both physical location and availability status information for the holdings of cluster members. To share resources extensively and without hardware/software discrimination, telecommunications between disparate systems must also be implemented. Dial-up links can probably be made without substantial development and can provide at least physical location. Availability status is also desired if it can be provided. However, the online (dedicated) telecommunications linkage between disparate systems should be explored and developed.

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84. William B. Rouse and Sandra H. Rouse. Management of Library Networks, p. 185.

Before telecommunications linkages are made, technical and cooperative agreements between two clusters must be developed. On the technical side, the two clusters must minimally agree on the content and data structure of the records to be transmitted, format of queries to be keyed in by the requester, communication mechanisms used to transmit data, and transmission speed.[85]

Cooperative, signed agreements between clusters will determine the level of services provided. Agreements should minimally include how the clusters will be linked; the telecommunications costs; when database files will be queried; how loan requests will be processed and delivered; and if there will be a monetary charge. For example, two clusters may agree that the telecommunications link will be online (dedicated) with the costs shared by all cluster members; that the clusters will access each other's database file first; and that there will be free reciprocal borrowing using the Regional Public Library System's delivery system.

The type of telecommunications link used between clusters will depend upon the following factors:

a. a cluster's potential to own the desired resources; A directory of cluster members' collection strengths and the technical and subject expertise of their personnel could be compiled and distributed in a print or online mode to all network access points. One way of developing this directory would be to invite librarians and other subject specialists (teachers, for example) from other libraries and institutions to come to the library and analyze the collection.[86]

b. capability of providing both location and availability information;

c. distance between clusters; and

d. access to a delivery system.

Utilizing a dial-up link would require clusters to designate a library in each cluster to become the switching point between clusters. For example, a remote site in cluster A, unable to find a resource in the cluster's database file, would request the cluster's designated dial-up switching point to access cluster B's database file. (Such requests would more than likely be batched.) If an online (dedi-

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85. Martin, p. 22.

86. Dorothy Sinclair, "Cleveland Case Study," p. 124.

cated) link was available, the remote site in cluster A, unable to find the resource in the database file, would simply key in a command through the terminal which would cause cluster A's computer to contact cluster B's computer and access that database file. There would be no need in this type of access for any human intervention, as the computers themselves are used as switching points. An online (dedicated) link would be more effective in facilitating resource sharing between clusters.

3. between INCs and clusters

A dial-up telecommunications link from INCs to clusters will provide the INCs with access to the database file of the cluster. As outlined in the section above on the links between clusters, INCs and clusters will also need to develop technical and cooperative agreements. Because the telecommunications link is essentially one-way in that the INCs lack a local database file. INCs will more than likely be responsible for the telecommunications costs unless other arrangements are made. such as the recommended toll-free line at the cluster, or the cluster and INC agree to share the telecommunications costs and the INC serves as the INC for the cluster providing access to search and cataloging/ILL services. etc.

Factors influencing the hierarchical level of cooperation between INCs and clusters will include the types of resources of the cluster, capability of providing location and availability information through the link, distance from INC to cluster, and delivery systems.

All linkages are based upon existing telephone technology. Alternative modes of linkages including microwave, satellite, and cable should be explored and analyzed for future utilization. Additionally, the quasi-governmental Massachusetts Corporation for Educational Telecommunications (MCET), currently designing a statewide network, should be continually monitored for future participatory consideration by the Massachusetts Board of Library Commissioners as the network develops.

1.3 Develop interfaces between circulation/ILL control systems and cataloging utilities

The interface between a circulation/ILL control system and a cataloging utility(ies) provides cluster members with the ability to copy bibliographic records from a cataloging database file and immediately place those records in the circulation control system's database file.[87] Such a capability ensures that the circulation/ILL system's database file is as up-to-date as possible. Additionally, the interface serves as a time and laborsaving device. To input cataloging records into the circulation control database file, cluster members must wait for a computer tape of machine-readable records provided by the cataloging utility for merger with the database file, or use personnel to re-key the record directly into the database file.

Many such interfaces currently exist utilizing microcomputers, "black boxes," or other hardware/software configurations. Cluster members utilizing a cataloging utility should be encouraged to acquire an appropriate cataloging utility-circulation/ILL system interface.

However, interfaces between a cataloging utility and circulation/ILL systems in use by Massachusetts libraries may not exist. Such an interface should be developed for those clusters participating in the network.

2.0 Develop document request and delivery procedures

As access into the information resources of the Commonwealth improves, the need for more efficient and effective methodologies to request documents for loan and to ensure their delivery increases. By being able to locate materials faster for users, their expectations of actually receiving these materials without delay are being raised.

Most access points into the information resource will be open to the user and also to the librarian lacking direct access. Questions arise as to the role of the access point in providing document request and delivery services to users who are not the primary clintele of these libraries and to other librarians. As stated in the Principles, the network must support the local library, not compete with it.

A request from a non-primary user or other librarian can be handled in three general ways:

1. the access point informs the patron or librarian of the item's location and suggests that the local library (of whatever type) request the material and its delivery through that library's standard ILL procedures.

2. the access point forwards the request for the user or librarian and asks that the document be delivered to the user's or librarian's local library or the most appropriate library on a delivery system.

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87. Epstein, p. 434.

3. the access point requests the document and handles its delivery

The cost of providing these services increases from alternative 1 to 3. Access points open to the public must provide alternative 1 as a minimum. Alternative 2 is recommended since the access point may have the means to forward a request electronically, thus improving turnaround time. The user will use the local library to receive the document which includes the library in the networking process. Depending upon the type of linkage employed (online or dial-up), the cost for requesting an item will be negligible to marginal. Alternative 3 will be more costly. It should be available to non-primary users and other librarians on a cost-reimbursement basis if the access point library desires it and the user or librarian is willing to pay the cost.

The automated resource sharing network in Massachusetts will be necessarily hierarchical. Access points technically can only search one database file at a time, and cooperative arrangements between clusters, and between INCs and clusters, will help structure the searching and routing patterns into a hierarchical network. Linking circulation/ILL control systems with other clusters, and INCs with clusters, will result in more horizontal patterns of lending and borrowing between libraries, replacing the present pattern of upward, vertical borrowing.[88] This is likely to result in less demand at the next higher level (clusters and large libraries lacking circulation/ILL systems). Many small libraries that are members of the network will readily borrow from each other. This type of cooperation will flourish once sufficient input has been made into the cluster database files.[89] Such a hierarchy will allow larger and special libraries to function as last recourse centers and to give more attention to those requests which they are best equipped to handle.[90]

2.1 Document requests

Once the holdings of the network are identified by the user, the next step is to place a request for the desired item. When location information is provided, items will not be requested from libraries that do not own them. With the addition of availability information, access points will probably not request items that cannot be immediately delivered. This will most likely result in reducing the average total time to satisfy a request, because turnaround time can be reduced if the borrower can reduce the amount of work the lender has to do.[91]

Using electronic means to identify the holdings and to transmit the request increases the success rate and is more efficient. Whenever possible, the request should be placed in machine-readable form

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88. Galvin, "Library Networks - Trends and Issues in Evaluation and Governance," p. 291.

89. Kenneth E. Toombs, "Large Academic Libraries," p. 148.

90. Ernst, p. 180.

91. Rouse and Rouse, p. 185.

in online realtime rather than in a batch mode so that processing can begin immediately.[92]

There are three methodologies for requesting items:

1. online or dial-up in realtime (node-to-node)

   In this mode, the borrower places a request for the document after the database file has been searched and the ownership record located. The item desired is immediately placed on a systemwide hold, and the lender's computer sends a message to the lender and borrower that the item has been reserved.

   In some circulation/ILL control systems, the computer lacks the capability to inform the lender of the request. The borrower must then notify the lender of the reserve by telephone, mail, or electronic mail.

2. batched and electronically mailed by dial-up

   Commonly known as an EMS (electronic mail system), this alternative offers the rapid transmission of messages between two or more computers or terminals connected by telephone lines, satellite, microwave, or other transmission medium.[93]

   A batched system will require coordination and personnel efforts. Not every cluster member will have direct access to a computer-based message system to communicate with other clusters, since it requires dial-up capability (microcomputer or terminal) and communications software. All INCs will possess the necessary capability. More likely, a cluster member provided with the necessary hardware and software would be designated to coordinate the activity. Requests from other cluster members would be forwarded to the designated member and manually batched for electronic transmission to a Public Data Network (PDN) or another microcomputer. Requests from other clusters and INCs would be received at the designated library and disseminated to cluster members.

   There are two proven options:

   a. electronic mail through PDNs or Value Added Networks (VANs) (computer-based message systems)

      PDNs and VANs, such as TYMNET and TELENET, are operators of packet-switching networks which are shared, leased lines to transmit messages from any dial-up or

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92. James G. Williams and Roger Flynn. "Network Topology," p. 75.

93. Deanna Marcum and Richard Boss, "Information Technology," p. 602.

dedicated line terminal to a host computer. The host computer has the capability of creating and storing electronic mailboxes that a sender can use to leave a message for another person or institution. In fact, a sender can leave the same message with several mailboxes at the same time, greatly reducing personnel and telecommunications costs.

Electronic mail through PDNs or VANs has several advantages for document requests:

1. improved turnaround time since messages are in the electronic mailbox instantaneously whether or not the recipient is there;

2. cost savings due to less typing, selection of time to send and receive, ease of use, and reduction of manual mailing procedures;

3. easy address, storage, and retrieval; and

4. reduction of backlog of requests to be typed, sorted, proofread, and mailed.[94]

It requires that both the borrower and lender use the same EMS (such as ONTYME II) and are aware of each other's mailbox address.

b. microcomputer to computer or to another microcomputer (node-to-node)

Microcomputers offer speedy and relatively inexpensive communications. Requests can be keyed onto floppy disks offline and edited as necessary. Transmission of the requests on the floppies to a computer or to another microcomputer can be implemented automatically using a modem when telephone rates are low.[95]

This option requires both ends to have computers (two micros or one micro and a computer) and communications software that are compatible (not necessarily identical). Both computers must be powered on for transmission and reception which usually means that the computers must be on throughout the night in order to take advantage of the lowest telephone rates. An electronic timer, similar to the type used in homes to turn on lights at a predetermined time, could be installed to turn computer equipment on and off. In addition, a program could be written that would enable a computer to send requests to several other computers

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94. DeJohn, "Use of Electronic Mail for ILL," pp. 49-50.

95. Beth Givens, "Montana's Use of Microcomupters for ILL," pp. 260-2.

consecutively throughout a time period, thereby increasing the efficiency of the request process.

3. use of the U. S. Postal Service, commerical delivery systems, the Regional Public Library System, or other, similar modes

   Although slower than electronic means, these alternatives are available.

2.2 Document delivery

Although access points will be able to locate a resource, ascertain its availability, and request its delivery online, the delivery mode for the near future will be painfully slow. Electronic document delivery is technically feasible, available - and expensive.

The document delivery mode chosen to fill a request should utilize the fastest, cheapest, and most reliable means available. It is assumed that any monetary charges are borne by the requesting library or by the patron on a cost recovery basis. The choice of technology to implement delivery is a function of several factors; distance, response time necessary, size of item, and cost of service are primary.[96] Six alternative modes should be considered for non-electronic delivery - patron, U. S. Mail, overnight commercial delivery systems, UPS, cluster couriers, and the Regional Public Library System.

It may be that document retrieval by the patron will be the fastest and most utilized resource sharing mode. It places little cost on the user's library, although direct costs are incurred by the lender. As outlined in Principles, interlibrary loan to the user's local library is preferred because the network should not compete with, but enhance, local library services.

The U. S. Mail is also an oft-used means of document delivery because of the reduced library postal rate. However, document delivery by the Post Office is slow and certainly unpredictable. Although much faster, the Post Office's Express Mail and other overnight commercial delivery systems such as Purolator and Federal Express are expensive.

United Parcel Service (UPS) delivers to all communities in Massachusetts. If a library has in-house pick-up and delivery, it offers convenience and greater speed than mailing library rate and it is cheaper than the overnight systems. It is, however, more expensive than postal library rate and not as fast.

The fastest mode of document delivery within a circulation/ILL cluster would be an exclusive shuttle or courier between members. However, its disadvantages include start-up and maintenance costs for

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96. Williams and Flynn. p. 75.

vehicle and personnel. Additionally, it would be seriously limited in delivery to other clusters or cluster couriers outside its geographical range.

One of the most viable document delivery systems is that of the Regional Public Library System. Its scope includes all municipalities with libraries in the Commonwealth. Unfortunately, the system is restricted to public libraries. Also, there is no scheduled document delivery via the Regional System between the Eastern Massachusetts Regional System and those of the Central and Western Regions.

With planning, a legislative amendment, and increases in the Regional budgets, the present Regional System could expand its delivery systems to include non-public library INCs, non-public circulation/ILL cluster members, and other special, academic, and school participants in the multitype resource sharing network. Additionally, weekly or twice weekly connections between Regional Systems could be scheduled, ensuring a flow of material from one end of the state to the other. Such an effort would, in more cases, be faster and cheaper than postal library rates (less preparation of materials in using the Regional System) and cheaper, although not as fast as UPS and cluster shuttles.

Although not a component of the network, another source of delivery is the document or information broker, a commercial dealer providing resources on demand. Access points, particularly INCs, may want to use document or information brokers to assist users in securing resources needed (at a cost) more quickly than the network could deliver.

Full text databases provided through search services are one means of acquiring documents electronically. Although currently few in number (NEXIS and LEXIS are among the most popular), full text search service databases are growing both in number and in scope, and undoubtedly will become a more important mode of electronic document delivery.

Future considerations of full or partial text electronic document delivery should include telefacsimile and teletext/videotext. Telefacsimile transfer requires compatible equipment at both ends of the transmission, the product being a "photocopy" of the original. Virtually all telefacsimile machines can transmit via analog (voice grade) telephone lines. However, analog transmission is slow and has poor image resolution. High-resolution, subminute, digital telefacsimile machines transmit faster, thus reducing the telecommunications costs, while offering better quality output. Digital machines can transmit on analog or digital telephone lines, or such broad band media as coaxial cable, fiber optic cable, microwave, and satellite.

Because of the availability of other forms of electronic mail, document delivery is the only application in which facsimile has the potential of offering significant benefits. The transmission of interlibrary loan requests is more appropriately handled by computer-based, telecommunication links.[97]

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97. Judy McQueen and Richard W. Boss. "High Speed Telefacsimile in Libraries," p.40.

Videotext and teletext systems encompass the concept of Remote Electronic Access and Delivery of Information (READI), the delivery of information into the home or office. Videotext utilizes coaxial cable, fiber optics cable, microwave, or sateiiites to iink the home or office to a remote computer which stores information. The searcher, in a two-way interactive mode, queries a desired file and requests information transmitted to a telvision. terminal, or computer screen. Teletext is designed for limited information retrieval and is active in one direction.[98]

A videotext system could provide remote access to the library's online catalog, community calendar, information and referral file, or other databases to locate and deliver information. Libraries which are capable of videotext (or even limited to teletext) should develop for themselves. or in coordination with their local agencies, new information files and make old files electronically available. The network could provide a source for developing and sharing databases. Furthermore, the public library will have to maintain public terminals in public locations outside the library to provide services to people without terminals.[99]

Other technologies may become available in the near future for document delivery and should be continually monitored. For example, large quantities of data may be stored on digital optical disks for transmission via various media, or the disks themselves may be delivered for on-site or remote viewing.

3.0 **Develop a program of computer literacy/training for librarians who are without direct access to computerized network systems**

Many librarians in Massachusetts will not be in INCs or circulation/ILL clusters in the near future. However, with the combination of the "information explosion" and the "computer revolution." all librarians must be aware of automated technologies employed in library resource sharing and library management. A program must be implemented by which librarians with various types of technical skills can share their expertise.

Circulation/ILL cluster members must be willing to demonstrate the resource sharing capabilities of their hardware to librarians lacking such equipment. Workshops and programs sponsored by the clusters would increase librarians' understanding of applied technology.

For many librarians, the capabilities and equipment utilized by the INCs may offer both an insight to, and participation in, resource sharing activities thereby increasing their awareness of computers and automation. All INCs will possess the hardware and software to access search, cataloging/ILL, and circulation/ILL services. INCs should sponsor workshops demonstrating these services: how information retrieval searches are

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98. Sweeney. "Remote Electronic Delivery of Information through Libraries," pp. 18-9.

99. Ibid., pp. 22-6.

designed; the interlibrary loan mechanisms; and how requests for documents are initiated in the network. Such workshops would yield at least two benefits: first, librarians would gain a better understanding of automated resource sharing and the network, and learn of services that will assist their users to meet their information needs; and second, the INC and the librarians may utilize the available technology to embark on a **local** resource sharing effort. An example of the latter would be to have a local or area union list of serials, large print books, or other resources compiled on a microcomputer for access by participants. Also, an information and referral file or community calendar could be loaded into a microcomputer database for editing, printing, and updating, or bibliographies of unique and special resources offered by the participating libraries could be developed.

Librarians must also expand the uses of automated technologies in library management. By utilizing off-the-shelf software, INCs can help librarians in developing skills in such applications as word processing, scheduling, budgeting and statistical analysis to assist them in managerial reporting and decision-making. In addition, personnel in the INCs can work with librarians to explore the uses of microcomputers in such library-related tasks as local indexing and the creation of in-house databases.

14. STANDARDS

Standards are necessary in any cooperative effort. In the automated resource sharing network, objective or technical standards will be adopted to facilitate the coordination of resource sharing in a network environment by ensuring compatibility.[97] It is acknowledged that when accepting standards, there is a certain loss of local autonomy; however, this loss of autonomy is compensated by greater access to materials outside one's own collection. Furthermore, there is a cost to following standards. However, there is also a cost to **not** following standards - costs in duplication of effort and in failing to receive the benefits from resource sharing.[98]

Bibliographic control consists of those activities which are necessary to create and organize records identifying and describing library materials. Cataloging items utilizing cataloging codes, arranging items and records for retrieval, and creating the record structure are some of these activities.[99] If the objective is to share resources between clusters, and between INCs and clusters, a method of communicating bibliographic data between access points is needed. By standardizing the structure, content designation, and data content of the records, a high degree of compatibility can be achieved.[100]

Bibliographic control for the network must be based upon standardized cataloging rules (currently AACR2) and compatibility with the MARC format of the Library of Congress. Machine-readable bibliographic records produced by a cataloging utility or service should be consistent with AACR2 and MARC for any library using the utility or service. Libraries that participate as, or with, the Information Network Centers must agree to accept AACR2 (or successor) and MARC (or successor) as requirements to receive funding from the Board of Library Commissioners. Bibliographic database files on circulation/ILL control systems should utilize these standardized cataloging rules and record format. Cooperative library groups receiving funds from the Board of Library Commissioners for 50% or more of the costs associated with the central site circulation/ILL control system or equipment upgrade must agree to install a system that can support both standards and the necessary bibliographic authority control. However, applying these standards immediately may not be economically feasible because of the disk storage necessary for the MARC format. In that situation, the record structure must be MARC compatible, designed to be expanded to a fuller MARC record by providing the database file/record structure without further input to a bibliographic conversion vendor.

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97. Barbara Evans Markuson, "Revolution and Evolution," p. 24.

98. Henriette D. Avram, "Governance of Library Networks," p. 223.

99. Sally H. McCallum, "Role of Standards in Networking," pp. 376, 379.

100. Paul B. Lagueux, "Standards for Networks," p. 181.

A common format for bibliographic record structure will facilitate resource sharing communications between circulation/ILL systems. Before a circulation/ILL cluster develops its record structure, other structures being used by Massachusetts systems should be explored for adoption or adaption. Cooperative library groups receiving funds from the Board of Library Commissioners for 50% or more of the costs associated with the central site circulation/ILL control system or equipment upgrade must agree to adopt a database record structure that will allow for telecommunications of bibliographic data content with circulation/ILL systems of similar technical specifications and with other circulation/ILL systems participating in the resource sharing network.

A common record format can be communicated between systems with similar technical specifications. However, to effectively share resources, communications protocols between disparate cluster systems, and between INCs and clusters, must be developed and implemented.[101] Technical agreements between clusters, and between INCs and clusters, should include the format of the queries to be keyed in for response, the communication mechanism used to transmit data, transmission speeds, and the equipment which allows the linking of communication and control equipment.[102]

Although the technical agreements will specify the telecommunications protocols used by the clusters and INCS, some programmatical and technical standards can be stated. To facilitate resource sharing communication, cooperative library groups receiving funds from the Board of Library Commissioners for 50% or more of the costs associated with the central site circulation/ILL control system or equipment upgrade must agree to provide five percent of the total number of ports, but not fewer than three ports, for telecommunications with other network access points. One of these ports must be available for dial-up communications.

INCs will receive funding to acquire dial-up communications capability. Modems acquired must be capable of transmitting at 1200 baud with downward capability to 300 baud. Operating at the higher baud rate will proportionally decrease associated telecommunications costs.

Elements of an interlibrary loan request form must be agreed to in the technical and cooperative agreements between clusters, and between INCs and clusters. As often as possible, INCs and clusters should share ILL request forms. Additionally, clusters and INCs may choose to utilize an electronic mail system (other than OCLC) through a Public Data Network (PDN) or a Value Added Network (VAN), such as Telenet, Tymnet, or Uninet, to request documents and other resources. Because of its increasing use, documented effectiveness, and popularity with resource sharing library cooperatives throughout the United States and to facilitate communications through a common PDN, ONTYME II is recommended as the electronic mail system. All INCs will be provided with initial membership and must agree to its annual review.

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101. Epstein. p. 436.

102. Sinclair, p. 22.

Although use of telefacsimile as a mode for document delivery must be delayed until the future, libraries in Massachusetts may need this technology, in particular, to share resources with libraries in other parts of the country. To ensure compatibility between machines of different manufacturers, the Consultative Committee for International Telephone and Telegraph (CCITT) has developed telefacsimile standards. Group I machines use analog transmission at six minutes per page, while Group II can transmit and receive at three minutes per page. Group III is subminute, digital telefacsimile transmission. Because of the better quality and considerable telecommunications savings of using digital transmission technology, it is recommended that libraries desiring telefacsimile capability acquire CCITT Group III equipment with downgrade compatibility to at least Group II to be compatible with the facsimile being used in other libraries.[103]

Standards utilized within the network will be evolutionary as the technology and the network develop. The Network Advisory Committee will continually monitor standards policies and operations.

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103. McQueen and Boss, p. 21.

15. FUNDING

Funding network operations is one of the major barriers to resource sharing in Massachusetts. Undoubtedly, the basis of financing the components of the network will be a combination of 1) local, state, and federal funds and 2) revenues generated by membership and cost recovery/reimbursement fees.

The most successful networks are those in which member libraries have made a significant commitment with funds from their operating budgets and view the services as an integral part of their essential operations.[104] Local funds should be provided to the library for participation in the automated resource sharing network because it is more cost-effective than the effort toward self-sufficiency. In many instances dollars are being reallocated within library budgets to buy access to collections of materials owned by other libraries.[105] Funding network operations becomes workable when the library recognizes its role and begins to view finance as the fuel for the network, not its chief stumbling block.[106]

The initial establishment of network access points - circulation/ILL control systems and INCs - requires considerable capital for hardware, software, site preparation, and associated costs. Adopting computer technology will require significant changes in library budgeting. The major problems are finding the needed capital and convincing library funders that capital investment is necessary.[107] Lack of capital is likely to be an increasingly difficult problem because of limited financial resources, and because the annual budget process encourages spending and impedes accumulation of funds for future capital gains.[108]

Local capital funds should be provided to the library for network participation. However, since it is a stated goal of the Board of Library Commissioners to increase access to the information resources of the Commonwealth, the Board should provide capital funding, as feasible, for installation of central site circulation/ILL control systems and the establishment and first year's implementation costs of the INCs. The Board of Library Commissioners should also approach the General Court for additional state funds for capital investment in the resource sharing network. Any funding administered through the Board of Library Commissioners for circulation/ILL control systems and INCs would be conditional upon recipients agreeing to meet requirements specified throughout this document.

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104. Sweeney, "Financial Impacts of Networking and Resource Sharing," p. 93.

105. Galvin, "Library Networks - Trends and Issues in Evaluation and Governance," p. 290.

106. Richard W. Waters and Victor Frank Kraiisz, "Financing the Electronic Library," p. 110.

107. Drake, p. 224.

108. Ibid., p. 233.

Because of the financial unpredictability of categorical grants, local network participants must be responsible for the system's operational costs. Only those clusters and INCs that can be maintained without grant money will be viable in the long run.[109] Local financial resources may be scarce, therefore, librarians must begin to think in terms of market creation and realize that improved services. If they are truly improved and desired by users, will inevitably create an increased market which will result in provision for increased resources.[110] Because of constraints on existing federal and local funds, the Board of Library Commissioners should approach the General Court for functional costs associated with the resource sharing network including increasing the availability of machine-readable bibliographic records. telecommunications, and reimbursing part or all of the transactional costs associated with hierarchical resource sharing.

The primary source of revenue for maintaining clusters and INCs will be membership fees paid by libraries from their operating budgets.[111] For cluster members, the fees will provide for equipment maintenance, telecommunications, and services provided by the cluster for the library. INCs are the cooperative venture of at least two libraries and associated costs can be proportionally shared between or among the libraries.

The automated resource sharing network is based upon telecommunications linking access points. Obviously, the telecommunications between remote cluster members and the cluster's central site computer is a local cost because it supports an essential library operation. Telecommunications costs between clusters, and between INCs and clusters, are shared and specified in the cooperative agreements. However, because of the importance of telecommunications to the network, the Board of Library Commissioners should ask the General Court to provide additional state funding and assistance which would reduce some of the costs associated with the telecommunications links between clusters, and between INCs and clusters. Such assistance could include the provision of a toll-free line for each cluster or a "library network rate" for reducing telecommunications costs. Another alternative would include establishing and operating or connecting with a Public Data Network (PDN) or a Value Added Network (VAN), such as Telenet, for computer-based message switching between access points and/or host computers. The evolving Massachusetts Corporation for Educational Telecommunications (MCET) network should be utilized when feasible to share technology and reduce the costs of linking access points.

Another source of operational funds for clusters and INCs is cost recovery/reimbursement fees assessed to other libraries and users. It is a mistake to insist upon an ad hoc principle that libraries must never offer extra services supported by fees. It is both ethical and feasible to charge users for specialized services which go beyond the current community

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109. Williams and Flynn, p. 62.

110. Stephan R. Salmon. "Remarks on 'Network Topology,'" p. 96.

111. Drake, p. 225.

standard for use.[112] Each given library service is not free but is almost always institutionally supported. The supporting institution - community, business, school. etc. - has given the library direction on the level of services it requires and will support; therefore, most services beyond this level appear to be cost recoverable.[113]

Open and unimpeded access to information is important. The freedom to know and to learn is essential in a democratic society. Fee opponents argue that charging any fees would impede access. Fee proponents argue that taxpayers. business managers. and educational administrators cannot afford to subsidize purely private goods. that is, services which benefit individuals alone, not society as a whole.[114]

A middle ground between proponents and opponents of fees includes 1) subsidy or support for libraries so that basic information can be provided free to users and 2) fees for services which are tailored to individualized needs.[115] Many libraries now impose restrictions on use of library resources for non-primary clients. Fees for **basic** public library services, such as entry to a library, a library card. or resource referral information, are practically, politically, and philosophically inadvisable. Libraries should provide a reasonable level of service to patrons at no charge. Additionally, public libraries must consider reciprocal borrowing and interlibrary loan as related to standing state aid statutes and regulations. Fees for services which were formerly free would be unpopular.[116] Fees would generally be acceptable for **optional** services for which patrons could substitute their own effort or time. Libraries have charged users for services where costs are readily identifiable such as for reserve notices. cost materials, or equipment rental.[117]

There are several arguments for suppor of fee-based services to supplement free basic services:

1. Without fees. the library is limited by its budget to offering only those services for which the library can pick up the entire bill. Relaxing the library's stand on fees will give it more scope to offer a wider range of services.[118]

2. The support derived from fees will cushion the impacts of shifts in the level of institutional support.

3. The choices made by users willing to pay for services will pro-

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112. Don R. Swanson, "Evolution, Libraries, and National Information Policy." p. 91.

113. Waters and Krallsz, p. 118.

114. Drake, p. 231.

115. Ibid., p. 231.

116. Nancy A. Van House, "Public Library User Fees," pp. 120, 126.

117. Ibid., p. 108.

118. Ibid., p. 121.

vide librarians with a vitally needed form of visibility and feedback indicating which services are most valued and which ones are inefficient or useless.[119]

The most common pricing scheme is for the library to absorb the indirect costs and pass along the costs incurred directly for the service.[120] Assessments for a given fee should be sufficiently documented so that users would know how the fee was calculated, and fees should be transferrable to a third party, such as a business.

People will pay for services if by using the service, they can save time. If the library does not save them time, they will go elsewhere. There should be no charge for basic services, nor should all user groups be expected to pay for specialized services.[121] However, it is preferable to offer a service for a fee rather than not offer it at all.[122] Fees should be used only to supplement support from the primary financial source, not supplant it.

Services between clusters, and between INCs and clusters, can be cost recoverable/reimbursible subject to state and local laws and the network cooperative agreements. Being charged for loans can be a problem to libraries. What often occurs is that libraries will bypass those libraries charging for loans, thereby putting more stress on libraries with liberal lending policies.[123] The cooperative agreements between clusters, and between INCs and clusters, will result in the development of a hierarchical resource sharing network. Ideally, there should not be fees for loans among cluster members: free reciprocal borrowing and/or interlibrary loan should be one of the benefits of belonging to the cluster. All INCs and those cooperative library groups receiving funds from the Board of Library Commissioners for 50% or more of the costs associated with the central site circulation/ILL control system or equipment upgrade should agree to free reciprocal borrowing and/or interlibrary loan among members of the cluster and participants in an INC. Higher up in the hierarchy, though, fees for interlibrary loan may be imposed because the frequency and need for continuous cooperation with each other has decreased. The fees should be reasonable and reflect cost recovery or reimbursement. Additionally, it is recommended that the fees be assessed against individual libraries, not the cluster as an entity, unless agreed to in the cooperative agreement.

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119. Swanson, p. 93.

120. Van House, p. 107.

121. Ibid., pp. 121, 126.

122. Evaline B. Neff. " New York Case Study," p. 89.

123. DeJohn. "Public Library Cooperation as Seen from a Multi-state Network," p. 72.

16. GOVERNANCE

Governance, in the context of a library network, is concerned with the relationships among the participants and institutions with respect to accessing the informational resources, communication between access points, and document request and delivery systems.[124] In essence, governance includes the basic definition and continuity of the purpose and existence of the cooperative effort.[125] As such, governance is a political process in which the conflicting or, at least, divergent views of the participants are reconciled. The problem is that all the participants hold stakes which they may be willing to invest but are reluctant to lose. So the process of governance must recognize all the stakeholders and provide the means for reconciling their differences. The role of governance is to assure the preservation of diverse objectives while achieving jointly perceived objectives.[126]

It is important to distinguish between governance and management. Management is concerned with operational decisions used to achieve network goals and objectives. Governance permits those using the network to express their interests and concerns, and to establish goals and objectives as well as the policies by which goals and objectives are to be achieved.[127]

There are three instruments which provide the legal mechanism for establishing a library network:

1. a statute enacted by a legislative body;

2. articles of incorporation together with bylaws; and

3. a contract or series of interlocking contracts.

Four general types of governance structures are created from the legal mechanisms:

1. governmental library network - created directly pursuant to a statutory mandate to act as agencies of their respective governmental level (federal, state, or local);

2. quasi-governmental library network - an independent entity created by statute, sustained by fees, and given specific powers; and

3. nonprofit, non-stock, membership corporation library network - a

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124. K. Leon Montgomery and C. Edwin Dowlin, "Governance of Library Networks," p. 181.

125. Huntington Carlile, "Diversity Among Legal Structures of Library Networks," p. 192.

126. Dick W. Hayes, "Governance of Library Networks." p. 154.

127. Montgomery and Dowlin, p. 181.

separate legal entity. tax-exempt.[128]

4. formal agreements - formal agreements involving two or more municipalities to lease or purchase computer equipment to provide specific data processing services as authorized by M.G.L., Chapter 40, sections 4 and 4A.

A fifth type of governance structure without legal identity or status is the unincorporated association and cooperative, a collection of institutions joined together in an informal manner for a common purpose.[129]

The activities of a network are framed by agreements among the participants. Four basic kinds of agreements exist:

1. **an informal agreement** - mutual decision to cooperate, not binding upon the participants, with the disadvantage of not providing a formal, unambiguous record of the agreement to cooperate;

2. **written agreement** - lists the activities in which members have agreed to cooperate (a written, enforceable agreement is especially needed if one library comes to depend on another, whether or not there is a transfer of funds);

3. **constitution** - states the purpose of the organization and enumerates the titles of officers and rules for membership; and

4. **articles of incorporation** - contains the same kind of information as the constitution, but is a more formal document that is filed with the state government and establishes the cooperative as a legal entity. Incorporation offers several advantages: it provides the cooperative with the rights and privileges of a legal body, makes it easier to enter into contracts, and fixes legal responsibility providing limited liability for the individual members.[130]

The purpose of the network in Massachusetts is to **voluntarily** coordinate, facilitate, and improve access to the information resources of libraries in the State. Objectives include providing cooperative development and maintenance of common bibliographic and holdings databases, developing and operating systems for cooperative use of cataloging data, cooperative acquisitions and other forms of resource sharing, and developing and implementing procedures for document request and delivery. The network is not to interfere with the prerogatives of existing library boards. The network participant will continue to enjoy autonomy without diminution of authority since the powers of the network, expressed mainly through cooperative and technical agreements, relate only to the activities and programs of the network itself. Its primary concern is increasing access to resources.

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128. Carlile and Burkley. pp. 17-8.

129. Ibid., p. 18.

130. Ruth J. Patrick. Guidelines for Library Cooperation, pp. 92, 100.

It is recommended that four different, written agreements and three governance structures be the legal basis of circulation/ILL control system clusters, Information Network Centers (INCs), and the telecommunications links between access points which define the automated resource sharing network.

Formal, written agreements need to exist to define network activities and responsibilities:

1. **Between the Massachusetts Board of Library Commissioners and circulation/ILL control system clusters and INCs when either receive funding administered through the Board.**

   Based upon the percentage of total funding for the project and the share of funds applied that are provided through the Board, these contractual agreements will specify the responsibilities required of fund recipients, many of which have been noted in this document. For example, cooperating library groups receiving funds through the Board for 50% or more of the costs associated with the central site system or equipment upgrade must agree to install a system that can support the MARC format, AACR2, and authority control; adopt a database record structure that will allow for telecommunication of bibliographic data content; provide for network use five percent of the total number of ports, but not fewer than three ports, one of which is for dial-up; agree to free reciprocal borrowing and/or interlibrary loan among members of the cluster; have their cluster's bylaws approved as to form by the Agency; and other requirements. INCs must agree to function as an access point into the information resource by providing search, cataloging/ILL, and circulation/ILL services for users and other libraries. INCs must also provide free reciprocal borrowing and/or interlibrary loan to participants of the INC; agree to utilize AACR2 and MARC format standards in cataloging; acquire modems with a 1200 baud capacity downgradable to 300 baud; and use ONTYME II for electronic mail. INCs must maintain the services after the first year, and clusters are responsible for all operational costs. All agreements will require clusters and INCs to participate in the resource sharing network.

2. **Between members of a circulation/ILL control system cluster.**

   Cluster membership should be based on signed agreements between members, and on adopted bylaws. If the cluster receives funds through the Board of Library Commissioners for 50% or more of the costs associated with the central site system or equipment upgrade, the cluster must adopt a set of bylaws approved by the Agency as to form. Agreements should specify the responsibilities of members and the cluster, and, where appropriate, be applicable to M.G.L., Chapter 40, sections 4 and 4A.

3. **Between participants in an Information Network Center.**

   An INC is a cooperative venture of at least two libraries. In addition to the contractual agreement with the Board of Library Commissioners, libraries directly participating in an INC must at least have signed agreements specifying responsibilities and ongoing operations, and, where appropriate, be applicable to

M.G.L., Chapter 40, sections 4 and 4A. For example, the cooperative agreement may specify when participants may use the equipment for accessing databases or training.

4. **Between circulation/ILL control system clusters and between INCs and clusters.**

Cooperative and technical signed agreements between clusters, and between INCs and clusters, will define the hierarchical structure of the automated resource sharing network. Cooperative agreements will specify the general aspects of the telecommunications link and associated costs, the hierarchical level of the link (first link, second link, fifth link, etc.), procedures of document request and delivery, and cost recovery/reimbursement fees if any. Technical agreements will specify such items as the query language, transmission speed, and necessary hardware and software. Circulation/ILL control system vendors should assist networkers with the technical agreements. Agreements, where appropriate, should be applicable to M.G.L., Chapter 40, sections 4 and 4A.

In addition to the agreements, governance should be structured as follows:

1. Within circulation/ILL control system clusters and INCs.

A minimal governance structure would be embodied in the formal agreements between members of a circulation/ILL cluster, and between participants of an INC. Where appropriate, the agreements should be applicable to M.G.L., Chapter 40, sections 4 and 4A. While this structure will provide for shared data processing services, it will not provide the desirable recognition for the members of the circulation/ILL cluster or participants of the INC as a cooperative legal entity.

Clusters should incorporate themselves on at least a nonprofit, non-stock, membership corporation basis to take the advantages of incorporation discussed earlier. The agreements (applicable to M.G.L., Chapter 40, sections 4 and 4A, where appropriate) between participants of an INC are sufficient as a governance structure. However, participants should consider nonprofit incorporation to acquire tax-exempt and legal status.

Clusters and INCs may find it necessary to reconsider the established democratic governance principle, one vote per institution. Larger libraries may sometimes find it difficult to yield to policies formulated by the smaller members if these policies are too costly in terms of funds or services. While it is essential that every contributing member have some viable means to access the governance structure, proportional representation in governance, reflecting different levels of contribution by individual libraries, may be an alternative means to reflect the reality of unequal contributions.[131] A compromise may consider two levels of voting - one vote per institution on non-monetary

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131. Galvin. "Library Networks." p. 293; and Toombs. p. 148.

policies and a proportional voting formula for policies affecting funding or services.

2. Between the Board of Library Commissioners and circulation/ILL control system clusters and INCs, and within circulation/ILL control system clusters and INCs.

   Although incorporating cluster members or INC participants into a nonprofit, non-stock, membership corporation recognizes the cooperative as a legal entity. the General Laws of Massachusetts apparently do not allow for public library boards in two or more communities to purchase and use data processing equipment without the approval of the town or city (Chapter 78, sections 11 and 21; Chapter 40, sections 4 and 4A). Receiving authorization from a city or town would probably not be a substantive obstacle to purchasing equipment for initial installation or upgrade. However, the present legal situation has three disadvantages. First, if a city or town approves of the joint purchasing and sharing of data processing equipment for the library, the city or town involved may require that the computer also support the data processing needs of another municipal department. Such a requirement would slow computer response time and certainly impede resource sharing by restricting dial-up and dedicated line telecommunications from other clusters and INCs. Second, the Board of Library Commissioners could be in violation of the law if it transferred its proportional share of ownership of the control systems over to a cluster of libraries incorporated as nonprofit entities, at least two of which were public libraries in different political units. Third, participation of corporate libraries in clusters which are incorporated as non-profit corporations is vague as to legality.

To remedy the situation and encourage development of circulation/ILL control system clusters and INCs composed of various types of libraries, the Board of Library Commissioners should file legislation creating a data processing entity with quasi-governmental qualities which should include the following as a minimum:

1. Establish, or provide for the establishment of, a legal entity (not geographically based), perhaps by means of an agreement to contain specified provisions and to be entered into by member libraries or the communities they serve.

2. The entity shall have the ability to use debt financing to acquire, by purchase or lease, automated technologies: hardware, software, and firmware.

3. Libraries of various kinds - public, academic, special, and schools - shall be eligible for membership. Special libraries that are not profit centers within a profit organization should be eligible for membership or affiliation.

4. Equipment maintained, leased, and/or purchased for the legal entity shall be for the exclusive use of libraries.

5. The entity shall be entitled to receive equipment, services, and grants from state, federal, local, and private sources.

6. The entity shall be qualified, or entitled to be qualified, as a tax-exempt entity.

7. The entity shall have the power to contract for services as necessary and appropriate.

8. The entity shall be obliged to establish operating procedures and policies related to network services as specified in the most recent Automated Resource Sharing Plan approved by the Board of Library Commissioners.

While incorporating as a nonprofit, non-stock, membership corporation has certain benefits, that level of incorporation would not allow clusters with public libraries to purchase and own data processing equipment for the exclusive use of libraries without municipal approval, or to utilize debt financing (bonding for capital equipment). The quasi-governmental entity is further recommended because it would certainly have a better chance of receiving funds and assistance from the General Court than a nonprofit, membership corporation.

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To facilitate automated resource sharing in the Commonwealth, it is recommended that at least three legislative proposals be studied, drafted, and filed with the General Court. This section does not offer specific language but discusses those areas in which amended or additional legislation is desirable.

Document Delivery

One of the foundations of any resource sharing network is the availability of alternatives for document delivery to members. Currently, section 19C of Chapter 78 of the General Laws refers only to the Regional Public Library System, effectively restricting utilization of the document delivery system to public libraries. It is recommended that the legislation be amended to allow the Regional System to provide document delivery and retrieval to participants in the automated resource sharing network other than public libraries. Adequate funding for expanding the current delivery systems must accompany the amendment because additional resources will be necessary for the proposed service expansion.

Quasi-Governmental Entities

Currently, under sections 11 and 21 of Chapter 78 and sections 4 and 4A of Chapter 40, it is doubtful that circulation/ILL control system clusters and Information Network Centers (INCs) in which two or more of the participants are public libraries in two municipalities, even if incorporated as a nonprofit entity. can jointly purchase or lease data processing equipment without city or town approval, especially for the exclusive use of libaries. Second. the legality of including special libraries that are not profit centers within a profit organization as participants in an incorporated. nonprofit resource sharing corporation is vague. It is recommended that legislation be drafted that creates quasi-governmental data processing entities for the exclusive use of various types of cooperating libraries. A quasi-governmental network governance structure would enable clusters and INCs to use debt financing (bonds) to raise capital funds, become or remain tax-exempt, and contract for services as necessary and appropriate. Additionally, because of the quasi-governmental structure and legal status, the General Court may be more disposed to provide assistance and funds for the network. For example, assistance could include 1) appropriating all or some of the annual costs of providing toll-free telephone lines at the host computers of each cluster, and 2) providing state funds to help offset the transactional cost recovery/reimbursement fees that may be in place in the network hierarchy as specified in the cooperative agreements between clusters, and between INCs and clusters.

Telecommunications

Telecommunications links between access points are the basis of the automated resource sharing network. Currently, the links use existing telephone line technology. Leased. dedicated lines are billed monthly, computed by a rate per mile. Instate telephone charges are increasing

rapidly. Libraries can reduce the costs somewhat by multiplexing telephone lines into one leased, dedicated line from the remote library to the central site computer at the host library.

Automated resource sharing should be encouraged because it will increase access to information resources for all Massachusetts residents in a cost-effective manner. Therefore, it is recommended that legislation be filed, and/or special status from the telephone rate-setting Department of Public Utilities be received, that would establish a lower telecommunications "library network rate" for participants.

In addition, the use of cable, microwave, and satellite technology offers potentially substantive cost savings over leased telephone lines. The quasi-governmental Massachusetts Corporation for Educational Telecommunications (MCET) is developing a statewide telecommunications network, part of which is based upon linking educational institutions. It is essential that libraries, especially participants in the network, be able to take advantage of any statewide telecommunications effort that would be more cost-effective than leased telephone lines. Furthermore, libraries will want to be active participants in MCET's programming and teleconferencing capabilities. Therefore, it is recommended that the enabling legislation for MCET (Chapter 560 of the Acts and Resolves of 1982) be amended to include library participation and input at the Board of Directors' level through an ex-officio voting membership for the Director of the Massachusetts Board of Library Commissioners.

Alternative Funding

The resource sharing network in Massachusetts will be hierarchical, with cooperative agreements between circulation/ILL clusters, and between INCs and clusters, structuring the upward resource sharing process. Reasonable cost recovery/reimbursement fees will be allowed in the hierarchical structure. If reasonable fees impede resource sharing because of costs to the borrower, the Network Advisory Committee should study alternative solutions. The Board of Library Commissioners may need to file legislation that would provide state funds to offset some of the transactional costs associated with hierarchical resource sharing.

18. ROLE OF THE MASSACHUSETTS BOARD OF LIBRARY COMMISSIONERS

The Massachusetts Board of Library Commissioners is the state agency possessing the statutory authority and responsibility for the total library enterprise in the Commonwealth. In this position, the Board initiates, establishes, and exercises primary leadership for, and direction of, the Commonwealth's effort to develop and improve library resources and services.

Chapter 78, section 19E of the General Laws provides the Board with the authority to "establish a comprehensive statewide program for the improvement and development of library and media resources for all citizens." In developing this comprehensive program, the Board is charged to incorporate into that program libraries, media centers, and information activities of all types. Furthermore, the Board has authority to disburse appropriated funds to any library activity, regardless of type or jurisdiction, participating in cooperative activities. Defined as a regulatory and adjudicatory agency by the provisions of the State Administrative Code (Chapter 39A), the Board has the authority to promulgate the necessary procedural and technical standards to effectively develop and coordinate a statewide multitype library network.

Clearly, the Board of Library Commissioners has the responsibility and legislative mandate to plan, develop, establish, implement, coordinate, monitor, and evaluate an automated resource sharing, multitype library network for the Commonwealth. It is recommended that the role of the Board in relation to the network be:

1. to implement the automated resource sharing network plan by assuming responsibilities for the overall development and coordination of network activities and aspects of the network as appropriate;

2. to draft and propose legislation facilitating the development and growth of the network;

3. to act upon the recommendations of the LSCA Advisory Council as applicable to the plan or activities and aspects of the network; and

4. to establish a standing Network Advisory Committee and act upon its recommendations as they apply to activities and aspects of the network, as long as the recommendations or operations of the Committee do not conflict with the role of the LSCA Advisory Council.

The Network Advisory Committee (NAC) will serve as a forum for the discussion of issues related to resource sharing and networking. In addition, the Network Advisory Committee will assist the Board of Library Commissioners on a continuing basis by providing advice and submitting reports and recommendations concerning the activities and aspects of the network and its plan. The Network Advisory Committee will also assist the Board in implementing activities and aspects of the network as appropriate and by providing evaluations of network activities and operations. The LSCA Advisory Council may call upon the Network Advisory Committee to assist them in their advisory functions related to the plan, including

revision of the plan, discussing and prioritizing network activities, and other aspects related to network operations and activities as determined by the Council.

Representatives to the Network Advisory Committee will be appointed by the Board of Library Commissioners and include:

1. a representative from each automated circulation/ILL cluster whose computer system can be accessed via dial-up recommended by its members;

2. representatives from the Information Network Centers recommended by the participants;

3. two representatives from the LSCA Advisory Council recommended by the Chairperson;

4. two staff members of the Board of Library Commissioners recommended by the Director;

5. the Regional Administrators from the Regional Public Library System;

6. the Chairpersons of the standing Automation Committees of the Regional Public Library System;

7. a representative of the Massachusetts Conference of Chief Librarians of Public Higher Education Institutions (MCCLPHEI) recommended by the Chairperson;

8. a representative each from the Massachusetts Library Association, the Massachusetts Association for Educational Media, and a Massachusetts member each from the Boston Chapter of the Special Libraries Association and the New England Chapter of the Association of College and Research Libraries, recommended by the respective Presidents;

9. a Massachusetts representative from each cataloging/ILL service recognized as such by the Board of Library Commissioners; and

10. a representative from each of the formally organized library resource sharing consortia or cooperating groups existing in Massachusetts recommended by the Chairperson of the consortium or group. Consortia or groups must register with the Library Development Unit of the Board of Library Commissioners.

The Network Advisory Committee will develop internal operating and governance procedures for approval by the Board. Subcommittees should be formed to study and make recommendations concerning:

1. applicable standards (technical, bibliographical, etc.) to facilitate network development, operations, communications, and growth;

2. changes in technologies and their infusion into the network (such as telecommunications); and

3. network operational objectives and performance criteria for use in conducting evaluations.

Additionally, subcommittees should assist the Board and its staff to:

1. develop the technical and cooperative agreements between clusters, and between INCs and clusters, that establish the network hierarchy;

2. coordinate publicity of the network to the public and arrange educational/informational meetings and workshops for librarians; and

3. draft legislation related to activities and aspects of the network.

19. BIBILIOGRAPHIC RECORD CONVERSION

Increasing the opportunity to access the state's information resource is based upon locating a wanted item by finding which libraries own the item. Automating holdings information provides the most effective access. Before an item is accessible utilizing automated technologies, the existing bibliographic information must be converted into computer-readable form.[132]

Library holdings may be converted into electronic records through bibliographic utilities such as OCLC or through other appropriate cataloging services. Advantages of participating in an automated cataloging/ILL system include:

1. Utilities and services provide records in standardized and recognized formats including MARC, AACR2, and LC subject headings.

2. Holdings information attached to the record in the database increases the opportunity to access the item by other libraries for resource sharing purposes.

3. The electronic record provides the basis needed for participation in an automated circulation system.

Because it is important that electronic bibliographic records be accessible by other libraries for resource sharing, it is recommended that libraries participate in a bibliographic utility or service that also provides interlibrary loan access capability for conversion of their local records.

Although the process outlined above is recommended prior to participating in an automated circulation system, many Massachusetts libraries have an immediate need to join a circulation system cluster although they do not have an adequate number of electronic records to create a database without a retrospective conversion of their collections. There are three major alternatives for retrospective conversion, each with numerous options.

1. Search against full bibliographic records for a match of a locally-held item.

   There are two major options:

   a. Search remote bibliographic databases for the match.

      This process entails searching for a title on a remote database, editing the record when found to include local holdings information, and having the modified record reproduced on a magnetic tape or other medium for subsequent loading into the circulation system. This option should allow for the library to add its holdings information when a

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132. Issues and alternatives for this section are discussed in two sources: Susan Baerg Epstein, "Converting Bibliographic Records for Automation: Some Options," Library Journal (March, 1983) pp. 474-6; and Rob McGee, Discussion Paper on Data Conversion for Library Automation, rev. ed., Chicago: RMG Consultants, Inc., 1982.

match is found. However, that editing capability may not be available. If not, the tape produced must be modified with inclusion of local information prior to storing the record in the circulation system's database.

Once the record is in the database, other libraries should have the opportunity of attaching their holdings information.

b. Install one or more bibliographic databases onto the circulation system for record searching and matching.

This methodology has several variations. First, if the library has been creating electronic records through a bibliographic utility or service, the archival magnetic tape of holdings should be produced and loaded onto the circulation system. Additional local information may be added by the library after loading.

Once the record is loaded, other libraries participating in the circulation system may add their holdings information to the record.

Another variation is loading onto the circulation system databases created on other circulation systems. This variation is particularly attractive when the availability of records from archival tapes is limited. Members of the circulation system cluster obtain a database, load it onto the system, and begin matching against the database, editing in local information when a match is found. Obviously, the more closely the holdings of the importer and exporter are matched, the more matches will be produced. After the database has served its purpose, it is expunged from the circulation system.

Databases created on automated circulation systems provide a valuable tool for retrospective conversion of library collections. Therefore, to assist retrospective data conversion for libraries in Massachusetts, cooperating library groups receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with the central site system or equipment upgrade must allow, for a period of time and under conditions as specified on the contractual agreement between the cluster and the Board of Library Commissioners, network participants to copy the database for use in their own conversion projects. State funds should also be sought to assist in increasing the availability of machine-readable records for retrospective conversion projects.

2. Submit partial records to be matched against an existing file.

Utilizing this methodology, the library locally creates partial records containing sufficient information to attempt a match against an existing file provided through a vendor or on the circulation system. Many options are available with this alternative:

a. Send the library's shelflist to a vendor for conversion into machine-readable records.

b. Send a typed list of Library of Congress Card Numbers (LCCNs) of the library's holdings to a vendor for conversion, or use the list to be matched against the database(s) on the circulation system.

c. Use computers in the library to produce a machine-readable file of LCCNs for matching by a vendor or by running it for a match against the database(s) on the circulation system.

d. Use computers in the library to input brief-form machine-readable bibliographic records. Send the records to a vendor for matching or run the file against the database(s) on the circulation system for a match.

e. Use computers in the library to input LCCNs or brief-form machine-readable file records. Produce a magnetic tape of the file on the circulation system, and forward the tape to a vendor for matching.

Several of these options may be combined in the retrospective conversion process. In addition, there are numerous variations of each of the aforementioned options.

3. Create a local record by inputting full bibliographic data via keyboard directly into the circulation database.

Labor intensive and time consuming, this alternative is not recommended except for those records that cannot be converted by other alternatives.

No single alternative will provide an entire retrospective conversion. Considerations of methodology chosen should include:

- availability and quality of archival records;
- availability and quality of imported databases;
- quality and format of records provided by vendors;
- time allowed for the conversion;
- availability of human resources;
- capability to include local holdings information upon matching. (otherwise the matched record will require subsequent editing before it can be used on a circulation system); and
- cost analysis of the various alternatives considering the issues above.

Whenever possible, the retrospective conversion process for libraries onto a circulation system should:

1. Load archival tapes of machine-readable records belonging to the library created through its bibliographic utility or service. Add local holdings information as necessary. Provide access to the database for other participants to add their holdings information.

2. Import other databases as appropriate and feasible to be loaded into the circulation system for matching.

3. Create a file of LCCNs and/or brief-form records to be matched against remote databases (available through vendors or utilities) as matching is completed against archival and imported databases.

4. As a final resort, input full records into the circulation database once for each title. Share the record with other libraries in the circulation cluster for addition of local holdings information.

20. PUBLIC INFORMATION

The network is designed to increase access for residents to the state's information resources in a cost-effective manner by applying automated technologies to the resource sharing effort. Thus, utilization of the network will benefit both the user and the librarian. It is essential that both be aware of the capabilities the network will offer.

Although the network's mission statement is aimed at the user, it is most important that librarians be educated about the network first because the effort to reach the user will be locally-based. Librarians in other networks have stressed the importance of communications and have pointed to this ingredient as essential for success. Communication between members is facilitated by workshops, educational meetings, and formal and informal communication networks - all means of involving people in network activities.[133] To begin, the staff of the Board of Library Commissioners should prepare written, informational statements to appear in such media as MBLC Notes regarding the activities and aspects of the network plan, the establishment of the Network Advisory Committee, and the process for educating librarians and users about network activities. Informational meetings discussing the network plan with the staffs of circulation/ILL cluster members would be followed by discussion meetings involving cluster members from all clusters interested in exploring telecommunications links. Workshops and meetings would be scheduled to discuss specifics of the cooperative and technical agreements. Coordination would be provided by Board staff and the appropriate subcommittee of the Network Advisory Committee.

Concurrently, staff of the Board of Library Commissioners would be developing discussion guidelines and criteria for the development and establishment of the INCs. Informational statements from the Agency should generate interest on the part of libraries which have the ability and desire to become INCs. If this does not occur, staff may need to develop a list of libraries that have the potential to become INCs and contact the librarians directly for discussions locally. These proposed meetings would also be an opportunity for Board staff to discuss the network with other librarians in or near the community.

Additional informational/workshop meetings must be scheduled to keep librarians who are not participating directly in a cluster or INC informed of network activities and to explain how their users can benefit from the increased resource access. Such meetings should be held as locally-based as possible. As INCs develop, future meetings should be held to demonstrate networking capabilities.

Making the library user and potential user aware of the capabilities of the network will be primarily a local activity. A publicity campaign coordinated by the Board of Library Commissioners and the Network Advisory Committee should focus on assisting local libraries publicize the network, and on statewide efforts to inform the public through news releases and public service announcements on radio and television. Because the network

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133. Patrick, p. 184.

is designed to increase access to resources, the primary thrust of the publicity campaign should be to encourage use of local libraries to expand beyond the local collection through the network to resources in other libraries. Awareness must be raised on how machine-aided systems can help access, identify, and obtain data, documents, and literature needed for problem-solving and decision making.[134]

The success of the network will depend greatly upon its worth to users and librarians. Worth and utility will be based in part upon the demands generated for resource sharing. Users and librarians must become aware that the capability of their local libraries to meet all information needs is limited, but that cooperative efforts, such as the resource sharing network, could enhance their local library's chances of success in meeting their needs. The network must be given sufficient exposure and time to work.

In addition, the merits of the network should be made known to the appropriate government officials, administrators, and managers at every political and organizational level. The Board of Library Commissioners and the Network Advisory Committee should help librarians to develop strategies that will highlight the benefits to be derived from the network for users while at the same time eliminating duplication of effort and increasing services.

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134. Forest Woody Horton, Jr. "Information literacy vs. Computer Literacy," p. 16.

21. EVALUATION

Evaluation is the systematic appraisal of operations, products, or services resulting in the measurement of utility, effectiveness, or the difference between expectation and practice.[135] There are various points in time when evaluation can or must be done - when planning, members should evaluate the potential benefits they expect to receive; after and during operations to seek improvements; and when expanding or modifying activities.[136]

Evaluation is an activity whereby:

1. According to goals or performance expectations, current operations can be assessed. The difference between performance criteria or specifications and evaluation is important. Performance criteria essentially relate to the way the network is supposed to function. Evaluation is the process of judging the worth or value of the network. There are at least eight factors for performance criteria, to be viewed from two perspectives: 1) technical (network system) and 2) behavioral/social (human interaction by the user and librarian):[137]

   a. reliability - expressed as the probability of not failing

   b. flexibility - the ability to respond or conform to changing or new conditions

   c. accessibility - the capability to communicate with the resource sharing network by using a variety of different modes and media

   d. availability - the probability of gaining access to the network at the desired moment

   e. efficiency - the effective operation of a system as a function of its costs in terms of time, money, and energy

   f. effectiveness - the ability to achieve specified goals or ends, to perform or produce what was intended in the manner intended

   g. acceptability - the state of receiving or taking responsibility for a system as per written specifications and standards

   h. quality control - those methods and procedures instituted to

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135. Eleanor Montague. "Evaluation Studies of Resource Sharing and Networking Activities," p. 291.

136. Patrick, p. 153.

137. Montague. p. 291; and Williams, pp. 230-56.

ensure that the information put into and taken out from the system is correct in terms of form and content

2. Feedback is provided to the planning activity before implementation.

3. Several feasible decision alternatives or designs are compared prior to selecting one.

4. Feedback is provided between implementation stages.

5. An analysis can be conducted on how or why a decision or process succeeded or failed.

There are at least three general models employed in the evaluation process:

1. statistical techniques - utilize empirical data to compare or predict processes or attributes. Some of the techniques applied include:

   a. informal feedback from library personnel
   b. informal feedback from users
   c. analyses of cost and usage statistics
   d. formal surveys of operations in libraries
   e. operational research analyses - workflow and cost-effectiveness tradeoffs. The evaluation of the effectiveness of the network needs to include a cost-benefit analysis. Does the network increase access and improve operating efficiencies without transferring a burden of inconveniences or costs to the user?
   f. formal surveys of users

2. mathematical models/analytic - suited to problems that fit an existing mathematical model or for which a model can be constructed

3. simulation - combines statistical techniques and mathematical models that build a model of the entire system or subsystem using statistical probability distributions for generating and controlling transactions, but also utilizes analytical techniques to compute the values of certain variables.[138]

Evaluation is necessarily an ongoing activity of the network. The Network Advisory Committee shall be responsible for developing network performance criteria measures and utilizing evaluation techniques to apprise the Board of Library Commissioners of network performance and worth and offer appropriate recommendations.

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138. Williams. pp. 258-65; and Patrick. p. 154.

22. RECOMMENDATIONS

I. A multitype library resource sharing network based upon automated technologies should be implemented. The network will be hierarchical in that cooperative centers will communicate with other centers in a planned outward and upward process. All network services should be provided at a level of operation as close to the user as possible, and through local libraries as often as possible.

II. The Mission Statement and Statement of Related Activities of the automated resource sharing library network for Massachusetts should be adopted:

Develop cost-effective methods of resource sharing that will increase access to the information resources needed by Massachusetts residents by promoting cooperative efforts among libraries of various types and by reducing barriers to networking.

1. Develop and link bibliographic databases to provide greater access opportunities to resources.

   a. Develop access points into the information resource.

      1. expand participation in online circulation/ILL control systems where it is technically and economically feasible, and develop new systems where they are needed.

      2. develop Information Network Centers (INCs) to serve as access points into the total information resource by providing INCs with the capacity of utilizing search, cataloging/ILL, and circulation/ILL services.

   b. Develop telecommunications linkages between circulation/ILL clusters and between INCs and clusters to expand the scope of resources available for accessing and sharing. Linkages between disparate systems should be explored and developed.

   c. Develop interfaces between circulation/ILL control systems and cataloging utilities to ensure that the circulation/ILL system's database of bibliographic records is as current as possible for searching from other access points.

2. Develop document request and delivery procedures.

   a. Use electronic means to identify library holdings and to transmit requests whenever possible.

   b. Document delivery should utilize the fastest, cheapest, and most reliable means possible.

3. Develop a program of computer literacy/training for librarians who are without direct access to computerized network systems.

III. The Board of Library Commissioners should support resource sharing activities in the State by providing state and federal funds for

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developing access points as appropriate and feasible. In addition, the Board should seek state funds to assist in the costs of telecommunications.

IV. In order to facilitate resource sharing in the Commonwealth, cooperating groups of libraries receiving funds through the Board of Library Commissioners for 50% or more of the costs associated with central site circulation/ILL control systems or equipment upgrade should agree to:

1. Provide at least five percent of their system ports, but not fewer than three ports, for telecommunications links from other access points in the State. At least one of the ports should be provided for dial-up access, and a toll-free line is desirable.

2. Install a circulation/ILL control system that can support the U. S. MARC format, data content and rules of AACR2, and authority control.

3. Adopt a bibliographic record structure developed with the Board of Library Commissioners.

4. Provide free reciprocal borrowing and/or interlibrary loan among members of the cluster.

5. Have their bylaws approved as to form by Board staff.

6. Allow other network participants to copy, at the other group's cost, the database of bibliographic records (as specified in the contract) to assist in the conversion of records from manual format to a machine-readable format.

7. Participate in the State's resource sharing network.

8. Incorporate as a nonprofit, non-stock, membership corporation under Massachusetts laws.

V. In order to facilitate resource sharing in the Commonwealth, Information Network Centers (INCs) should:

1. Be in a library open to users and librarians.

2. Be an ongoing, cooperative effort of at least two libraries (of the same or different types).

3. Provide access to search, cataloging/ILL, and circulation/ILL services as specified in the contract with the Board of Library Commissioners.

4. Create machine-readable records via a cataloging/ILL service incorporating the MARC format and AACR2 codes.

5. Participate in a cataloging/ILL service that provides access to the database's bibliographic record file with holdings information for interlibrary loan purposes.

6. Demonstrate that they possess sufficient personnel and other resources within the INC membership to support continued operations.

7. Assume operational costs of the services after the first year.

8. Acquire modems capable of transmission at 1200 baud with downward capacity to 300 baud.

9. Use ONTYME II as one electronic mail service.

10. Sponsor and conduct workshops demonstrating search, cataloging/ILL, and circulation/ILL services to librarians.

11. Participate in the State's resource sharing network.

VI. Technical and cooperative agreements should be established between circulation/ILL clusters, and between Information Network Centers (INCs) and clusters, defining such areas as fees, scope and level of cooperation, responsibilities, communications protocols, document request and delivery procedures, and others.

VII. The Board of Library Commissioners should monitor and participate in the development and implementation of the statewide network proposed by the Massachusetts Corporation for Educational Telecommunications.

VIII. The Board of Library Commissioners should:

1. Amend existing legislation to allow the Regional Public Library Systems to provide document delivery and retrieval to network participants that are not public libraries.

2. File legislation to create quasi-governmental data processing entities for the exclusive use of various types of libraries.

3. File legislation and/or receive special status from the telephone rate-setting Department of Public Utilities that would establish a lower telecommunications "library network rate" for participants.

4. Amend existing legislation to include the Director of the Board of Library Commissioners as an ex-officio, voting member of the Board of Directors of the Massachusetts Corporation for Educational Telecommunications.

IX. The Board of Library Commissioners should establish the Network Advisory Committee charged with providing advice, submitting reports and recommendations, and providing evaluations to the Board concerning network activities.

X. The Board of Library Commissioners should coordinate, with the Network Advisory Committee, a public information program about the network for state residents and librarians.

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APPENDIX I

The Role of the Massachusetts Board of Library Commissioners in the Development of Multitype Library Networks and Resource Sharing Consortia: A Position Paper

Roland R. Piggford, Director

February 1982
Revised October 1983

As a document supporting the FY1982 budget recommendations of the Senate Committee on Ways and Means (Senate 2222, June 1981, Vol. II) "Policy Report 13: Libraries of the Massachusetts System of Higher Education" took note of a number of factors that have conspired to limit the effectiveness of library resources in supporting instructional programs at these institutions. Policy Report 13 emphasized the cost effective nature of cooperative activities, and suggested the benefits of such specific cooperative activities as coordinated periodical subscriptions, cooperative acquisitions and processing, the pooling of cataloging budgets to make the OCLC[1] cataloging data cost-effective for all libraries in the system, and computerized circulation control and analysis. All of those activities were envisioned as contributory to or dependent upon an ultimate data base consisting of the holdings of Massachusetts libraries in public higher education.

The Massachusetts Board of Library Commissioners wishes to bring to the attention of the state administration and the legislature the concept of statewide cooperative activities of a multijurisdictional nature; i.e., library networking on a statewide basis that would envision the linkage of data bases containing the records of all types of libraries, thereby serving a greatly expanded library constituency and contributing to the information needs of the Commonwealth's total economic and social development effort.

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[1]Online Computer Library Center (OCLC) the nation's largest automated bibliographic utility

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The position of the Massaschusetts Board of Library Commissioners with respect to the multitype library cooperative activity is based on the following premises:

I. The library holdings of the Commonwealth, although unevenly distributed, represent in total an information resource of substantial depth and diversity.

II. Effective, coordinated statewide application of computer and communications technology to the management and exploitation of the Commonwealth's library resource would impact enormously on the information needs of government, education, industry, commerce and our citizenry; and, consequently, on the total economic and social well-being of the Commonwealth.

III. It is possible, by means of governmental leadership and incentive, to open these resources, whether held publicly or privately, to the individuals and entities that have the need to use them.

IV. The Board of Library Commissioners, as the State's library development agency, has the statutory authority to deal with the problems of multijurisdiction, finance, and operational and technical compatibility attendant to the planning and development of statewide multitype library networks and resource sharing consortia.

V. In order to exercise its statutory authority, the Board of Library Commissioners must have sufficient and appropriate staff to fulfill its responsibilities for the coordination of technological development and the direction of planning, research and evaluation.

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1. *The library holdings of the Commonwealth, although unevenly distributed, represent in total an information resource of substantial depth and diversity.*

Policy Report 13 delineates two philosophies of library collection building to support higher education:

1. comprehensive acquisitions in all fields of knowledge;
2. basic, minimal collections which reflect or match the programs of individual institutions.

The Report further concludes that:

> "The first is a luxury which few libraries can afford, but, to which many libraries aspire. The second is a prerequisite. Yet libraries of the state's higher education system consistently fail to meet the prerequisite."

The Policy Report's documentation (Table 1) confirmed this deficiency vis-a-vis the minimum resource standards set forth by the Association of College and Research Libraries (ACRL).

TABLE 1

Total volumes owned, total volumes needed to meet ACRL standards and estimated cost, colleges and universities - 1980

	Total volumes owned	Total volumes needed according to standards	Dollars needed to meet standards
Boston State	165,700	256,650	$2,074,000
Bridgewater	201,800	364,550	3,710,600
Fitchburg	180,800	206,200	579,000
Framingham	143,300	169,000	587,200

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TABLE 1 (cont.)

	Total volumes owned	Total volumes needed according to standards	Dollars needed to meet standards
Mass. College of Art	64,000	181,600	2,683,000
Mass. Maritime	49,600	100,300	1,156,700
North Adams	118,500	127,000	188,000
Salem	275,000	297,900	521,600
Westfield	143,800	179,030	1,008,000
Worcester	163,200	306,500	3,267,000
Lowell	295,000	450,500	3,534,000
Southeastern	270,000	425,000	3,534,000
Univ. Mass/Amherst	1,825,000	2,112,000	$6,557,000
Univ. Mass/Boston	350,900	536,000	4,013,000
Univ. Mass/Worcester	82,000	148,000	1,503,000
TOTAL	4,319,600	5,850,230	$34,916,100

Source: "Policy Report 13: Libraries of the Massachusetts System of Higher Education" (Senate 2222, June 1981, Vol. II)

Although the Policy Report is specific only in terms of resource deficiences, additional data from the National Center for Educational Statistics indicate that, in general, fiscal support of libraries in the public academic sector in Massachusetts is substantially lower than support of libraries in the private academic sector, and that, in fact, a dichotomous relationship exists between library support for "quality" four-year college and university programs in Massachusetts and such support in the public education domain. We must assume that these depressed public funding levels dictate deficiencies not only in library holdings, but in the mechanics of service and the adequacy of staffing as well.

For public academic libraries, there are obvious implications in the general policy for state higher education set forth in the Senate Agency Narrative for Higher Educational Affairs (Senate 2222, June 1981, Vol. II):

> "Massachusetts is not in a financial position - and with the onset of Proposition 2 1/2 and other factors restricting state spending probably never will be - to provide public higher education funding comparable to that of 'quality' states."

Although the vicissitudes of public funding are not inflicted so directly upon private higher education, the accepted excellence of library resources of many of those institutions has been compromised during the past decade or so by the inflationary spiral, most particularly the rising cost of library materials.

The public library tradition in Massachusetts is stronger than the public higher education tradition. Legislation enacted by the General Court in 1851 authorized cities and towns to establish and maintain public libraries, and thus set the precedent for the tax supported municipal institutions that prevail today in all parts of the country.

Public libraries in such industrial and commercial centers as Lawrence, Lowell, Holyoke, New Bedford, etc., prospered during the late nineteenth and early twentieth centuries. However, the economic difficulties experienced by these communities in more recent years have resulted in severely depressed levels of local library funding.

Conversely, suburban libraries have prospered, with statistical studies indicating significant positive relationships among library activity and support indicators and municipal socioeconomic status indicators such as personal income, educational levels, etc..[1]

The tradition of local public library service, regardless of size of municipality, is also pervasive in Massachusetts, with free public libraries now operating in 347 of the 351 cities and towns. This, however, is not an unmixed blessing. In small communities, certain diseconomies of insufficient scale preclude libraries from approaching basic local self-sufficiency in terms of current availability of materials and point-of-service access to qualified personnel. In many other states, strong county government has provided a vehicle for expanding the funding base of local libraries and developing cooperative mechanisms to ameliorate such scale diseconomies.

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[1] A Survey of Non-Resident Lending and Borrowing Activity in Massaschusetts. Massachusetts Board of Library Commissioners, Boston, MA, 1979.

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Regardless of size and relative affluence, the effects of inflation on local fiscal capabilities have limited public library development in recent years. As indicated in Table 4, municipalities have made a substantial effort to increase public library funding, only to have that effort fall well behind increasing materials costs. This trend is particularly alarming in that it affects disproportionately libraries in the Commonwealth's larger municipalities, a number of which serve as regional or subregional resource centers for the Regional Public Library Systems. Proposition 2 1/2 has exacerbated this situation.

TABLE 4

TOTAL EXPENDITURES FOR PUBLIC LIBRARY SERVICES,
MATERIALS EXPENDITURES, AND MATERIALS PRICE INCREASE, 1977-1982

Municipality Population Groups	Per Cap Total Expenditure by Public Libraries 1977	1982	+-	Per Cap Materials Expenditures 1977	1980	+-	Materials Price Increase Between 1977 + 1982 Books	Periodicals
100,000 +	$13.25	$15.56	+17%	$1.83	+$1.62	-11%	37%	82%
50,000-99,999	9.30	9.00	-3%	1.38	+1.17	-15%	37%	82%
25,000-49,999	9.26	10.74	+16%	1.71	+1.70	-1%	37%	82%
10,000-24,999	7.91	10.10	+28%	1.56	+1.87	+20%	37%	82%
5,000-9,999	5.98	8.06	+35%	1.39	+1.77	+27%	37%	82%
2,000-4,999	6.36	8.74	+37%	1.55	+2.11	+36%	37%	82%
Under 2,000	6.43	6.01	-7%	2.05	+1.72	-16%	37%	82%

Sources: Comparative Public Library Reports, as published by the Massachusetts Board of Library Commissioners for 1977 and 1982.

Materials price data from The Bowker Annual of Library and Book Trade Information. R. R. Bowker Company, New York, 1983.

Nevertheless, the Commonwealth of Massachusetts enjoys a deserved national reputation for the overall excellence of its academic and public library

holdings. And in spite of fiscal exigencies, in excess of $125 million is currently spent in aggregate annual support for public and academic libraries. This is a substantial investment. Relatively small investments in a statewide planning capability and advanced computer and telecommunications technologies are defensible in terms of cost-effectiveness and expanded services.

Municipal libraries and public academic libraries do not exhaust the category of publicly supported libraries in the Commonwealth. The George F. Fingold State Library serves the reference needs of the legislature and other activities of state government. Various state agencies maintain their own library and information services, as do a number of Federal agencies located in the Commonwealth. A number of libraries serve publicly supported health, judicial and correctional agencies and institutions. Libraries supporting elementary and secondary education exist, but their development has been inhibited by the paucity of local funds, the lack of state funds, the loss of federal funds, and the absence of library related expertise on the staff of the Massachusetts Department of Education.

Particular mention must be made of the many special research libraries and information services supporting the private commercial and industrial sectors. Traditionally, these activities have pioneered the application of cost-beneficial information technology. It is imperative that any statewide plan for library networking and resource sharing provide for the eventual inclusion of these resources.

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II. *Effective, coordinated statewide application of computer and communications technology to the management and exploitation of the Commonwealth's library resources would impact enormously on the information needs of government, education, industry, commerce and our citizenry; and, consequently, on the total economic well-being of the Commonwealth.*

Networks have the potential to reduce costs through the economy of scale phenomenon, through resource sharing, through the assignment of subject responsibility, and through astute and careful network management.

Precise cost-benefit estimates depend upon a number of factors; network purpose and configuration, database size and relevance, etc.. However, for the purpose of illustrating concept, certain statistical models have been developed related to (1) potential cost benefits in cataloging and processing, and (2) potential service effectiveness based on shared resources.

As indicated in Figure 1, the statistical model for the cost-effectiveness of shared cataloging utilizing a computerized data base predicts a "hit rate" of approximately 64% as the threshold for reducing the unit cost of shared cataloging below the unit cost of manual cataloging. A hit rate of 100% would reduce sharing cataloging costs to 48% of manual costs. Obviously:

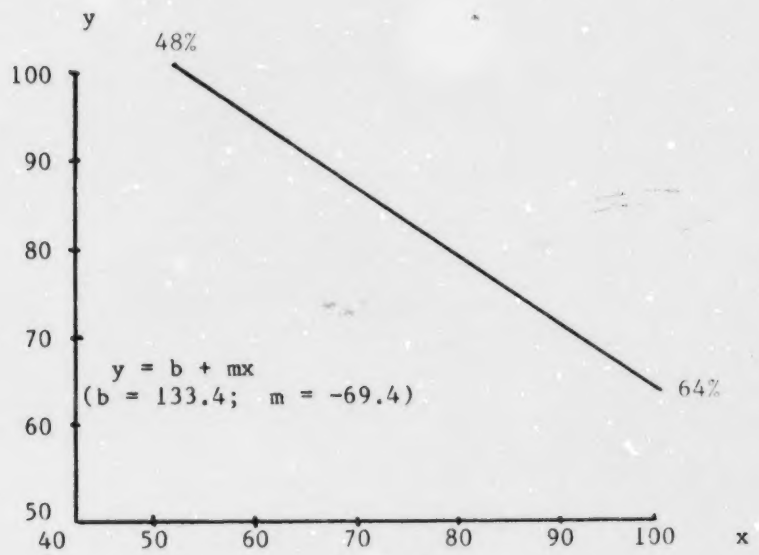
The more libraries participating in the system, the larger the data base;

The larger the data base, the higher the probability that cataloging data for any particular title will be found in that data base;

The more titles found, the lower the cost of the cataloging operation.

FIGURE 1

LINEAR REGRESSION MODEL FOR POTENTIAL COST-BENEFITS
IN SHARED CATALOGING UTILIZING COMPUTERIZED DATA BASE



It should also be pointed out that cost savings are not the only advantages achieved through shared cataloging. Considerable service benefits are realized through the substantially earlier shelf availability of materials.

The most frequently used statistical model to predict the service-effectiveness of resource sharing is based upon a square-root-times-ten improvement in query response. For example, a library answering 49% of information and materials requests from in-house resources should be able to answer 70% of such requests if it has access to a shared bibliographic data base. As Figure 2 indicates, the relationship is curvilinear, with the libraries able to answer the fewest information requests based on their own resources gaining the most through resource sharing arrangements.

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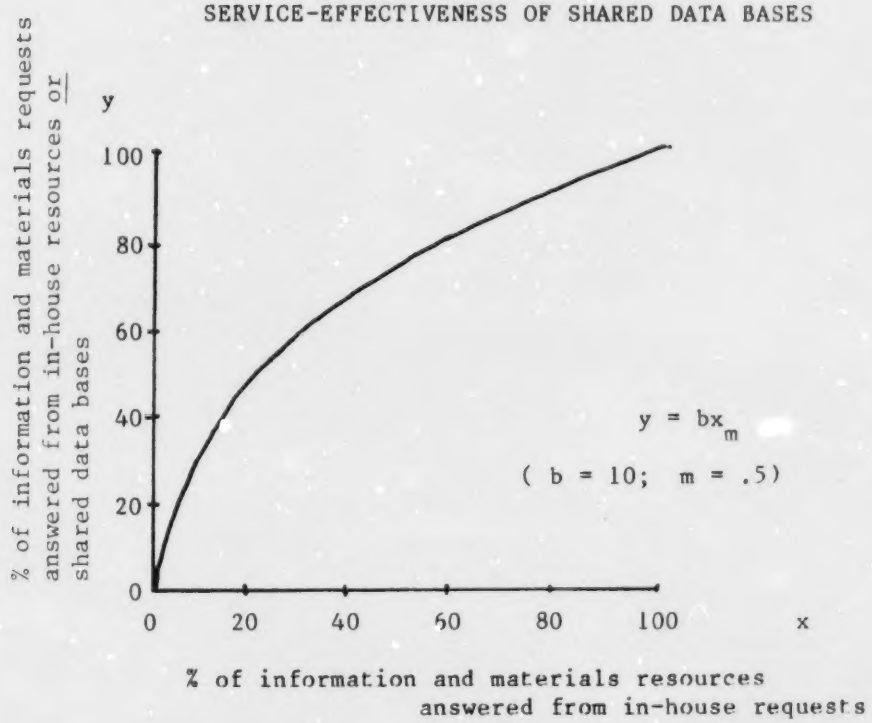
FIGURE 2

STATISTICAL MODEL FOR PREDICTING

SERVICE-EFFECTIVENESS OF SHARED DATA BASES



Although the cost reduction potential is inherent in both single type and multitype networks, multitype networking offers the additional advantages of:

1. Intensifying the economy of scale phenomenon

The cost-effective and service-effective potentials of resource sharing are, as previously stated, intensified by building larger and larger data bases. These potentials are also positively influenced by diversity within data bases; i.e., the inclusion of the records of holdings of libraries with differing purposes, clienteles and collection strengths.

2. Diversifying and expanding funding responsibilities

The design costs, start-up costs, and research and program expansion costs necessary to network development and management can be distributed among the various state, federal, local, and private fiscal authorities responsible for library and information services.

3. Relating information resources to the state's total economic and social development program

The planning of library and information services should be considered a necessary and respected component of total economic and social development planning, and the states that have been most successful in statewide library networking and resource sharing have recognized these relationships. They have stressed the developmental role of library and information services in supporting the administrative, research and human resource needs of those public and private sector activities impacting most significantly upon the state's economic and social well-being.

In Massachusetts, for example, it would be necessary to consider, as a priority item, the importance of access to scientific, technological and management data for the "information dependent" (vs. "labor dependent" or "materials dependent") high technology industries which rely heavily on their research, development, and management information components. Many of these needs are not met by their own information resources.

In addition, multitype consortia development would broaden information access for the multiplicity of small Massachusetts-based research and consulting enterprises that, in total, constitute a significant component of the state's economic and social development effort.

In states with well-developed statewide multitype library systems the prevailing use of such systems is "developmental" in nature; that is, clearly related to human resource development and the research and administration needs of government, commerce and industry. User analysis of the New York State Interlibrary Loan System (NYSILL) provides a case in point. NYSILL users are divided into the following six categories, primarily for purposes of analysis: faculty, industrial researcher, professional, student, resident of correctional institution, and general public. A small residue of users (approximately 5% annually) remain unclassified.

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For FY1980, the year of last published data, use was distributed as follows:

TABLE 5

USE OF NEW YORK STATE INTERLIBRARY LOAN SYSTEM, 1980

User Categories	% of Use
Student	25
Faculty	19
Professional	17
Industrial Researcher	7
Resident, Correctional Institution	1
General Public	27
Unclassified	4

Source: New York State Education Department, Division of Library Development, 1980.

From the breakdown, it can be seen that the academic user is NYSILL's prime patron, with "faculty," and "student" categories comprising almost half (44%) of total use. The profit sector's use, however, is rapidly increasing. During FY1979, the user group with the greatest growth rate was the "professional" category, up 13% over FY1978; and in FY1980 the "industrial research" group showed the most growth, an increase of 27% over FY1979.

The network's role in the social and economic development process is further defined by reference to the 5 major subject areas receiving the most requests, which are ranked as follows by Dewey Decimal numbers, a required component of the NYSILL computer format.

TABLE 6

FIVE SUBJECT AREAS RECEIVING MOST REQUESTS:
NEW YORK STATE INTERLIBRARY LOAN SYSTEM, FY1980

Rank	Dewey Classification	Subject Areas
1	610 - 619	Medical Science
2	620 - 629	Technology
	670 - 699	Engineering
3	330 - 339	Economics
	350 - 359	Public Administration
4	300 - 309	Social Science
	360 - 369	Social Welfare
	390 - 399	Customs - Folklore
5	560 - 579	Paleontology
	590 - 599	Anthropology

Source: New York State Education Department, Division of Library Development, 1980.

Over the years the heaviest demands on NYSILL have been quite consistently in the scientific and technological areas.

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III. *It is possible, by means of governmental leadership and incentive, to open the Commonwealth's library resources, whether held publicly or privately, to the individuals and entities that have the need to use them.*

Factors inhibiting the full development of multitype library consortia are numerous. Some are real, others are hypothetical. Some are particular, others are conceptual. These factors may be political, economic, or philosophical in nature.

The problems of multiple and perhaps conflicting jurisdictions are present and palpable. Policy making, governing and fiscal authorities are elected or appointed to protect the interests of primary constituencies, and a degree of loss of local autonomy is the inevitable result of any cooperative effort. Further, existing patterns of support, public or private, may well have created pockets of vested interest in the status quo, and a consequent reluctance on the part of these institutions to endorse or participate in new arrangements. It becomes the responsibility of state government to delegate to a proper state agency the authority to spend public monies across jurisdictional lines, regulate technical and performance standards, enter into contracts with public and private entities, provide for the proper representation of participating jurisdictions in the governing structures of networks and resource sharing consortia, and develop equitable models for funding and remuneration. In 1974, the Massachusetts General Court, in enacting the Comprehensive Library Media Services Act (Ch. 78, Sec. 19E), authorized the Massachusetts Board of Library Commissioners to fulfill such a coordinating function.

The philosophical impediments are equally significant--and perhaps more difficult to overcome. For decades prior to 1970, a "warehouse" philosophy prevailed with respect to the concept of the function of a research library. The quality of those libraries was generally measured by the amount of money expended annually to acquire, catalog, and house large numbers of books and journals. Even smaller academic and public libraries were "materials oriented" in their approach, with standards and budget justifications based on input measures--principally, funds allotted for materials purchases.

During the 1970s, a considerable volume of research literature brought forth conclusions to the effect that comprehensive acquisition policies did, in fact, lead to the warehousing of materials rather than the broadening of use; that a minority of titles accounts for the majority of use by the clienteles of every type of library, that books and journals in many disciplines are subject to extremely rapid rates of obsolescence, and, most disturbingly, that in some instances as high as 40% of materials purchased during any given year were not used at all during a subsequent 10-year period.[1]

Nevertheless, a considerable number of large, urban public libraries with research collections, continue to lobby vigorously for state and federal funds to continue comprehensive acquisition policies in the face of decreasing local funds. This, of course, has posed a dilemma for state governments. Regardless of the present prestige factor or the future historical value of in-depth research collections, state library development agencies have concluded generally that support of these research libraries should be based on their actual, current, quantifiable participation as a statewide or regional library resource; that is, the standards for state participation in the finance of these libraries should reflect the extent to which they are actually delivering materials into the hands of the broadest possible clientele.

The current fiscal climate places immediate and potential limits on almost all funding sources: public and private; state, local and federal. *When the supply of new money is limited, maintenance of service must come at the cost of collections expanded through traditional avenues of purchase and exclusive local ownership.* In promoting multitype, statewide resource sharing, the state library development agency must first obtain from library professionals and funding authorities a widespread commitment to the concept of "access to information" rather than the concept of "ownership of materials."

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[1] Allen Kent, et al, Use of Library Materials: University of Pittsburgh Study. Marcel Dekker, New York, 1979.

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While it is our assumption that the impetus in the development of statewide multitype systems would come from those libraries receiving state funds (public and academic), future involvement of the private sector might well be dependent upon the sophistication of the research and development component of the Board of Library Commissioners; specifically, its ability to quantify the elusive values we attach to information accessibility and relate such values to the economic and social aspirations of the Commonwealth.

A growing number of state governments and state library development agencies have recognized their responsibility to fund and support the development of multitype cooperation and resource sharing through statewide networking. An examination of state involvement in planning, coordinating and providing fiscal support for multitype systems in the other five New England states and the ten states (New York, New Jersey, Kansas, Wisconsin, North Carolina, Michigan, Minnesota, South Carolina, California, Illinois) cited as having "quality" systems of public higher education in the Senate's Agency Narrative for Higher Educational Affairs (FY1982, Senate Budget Document) reveals that:

1. Thirteen of the fifteen states have some measure of statewide multitype library cooperative activity, with the state library development agency involved in planning, coordination and/or governance.

2. Of the ten states identified by the Senate Ways and Means Committee as possessing "quality" public higher education systems, eight have involved these systems, by legislative incentive, in multitype library resource sharing consortia.

In many states, governmental leadership has been successful in fusing the interests of the public and private sectors into workable resource sharing arrangements. As a case in point, we offer the Capital District Library Council for Reference and Research (New York), one of nine such Councils operative in New York for the past 15 years. These Reference and Research Library Resource Systems, usually referred to as the 3R's systems, are composed of public libraries, college and university libraries, business and research libraries, governmental libraries, and hospital and other

health agency libraries. All public libraries and State University libraries, and almost all independent academic libraries are involved.

The primary goal of these systems is the sharing of resources to answer the information needs of the clienteles of all member libraries. They provide interlibrary loan services, delivery services, cooperation in collection development, microfilming and preservation programs, reciprocal or direct access, production of union lists and bibliographic control programs, and cooperative use of computer systems. Through interface with the New York State Interlibrary Loan System (NYSILL) and with OCLC and other computerized data bases, they are able to locate and borrow almost any library item requested by users of member libraries, no matter how small these libraries are.[1]

Membership composition of the Capital District Library Council illustrates the multijurisdictional nature of these consortia (Table 7).

TABLE 7

MEMBERSHIP COMPOSITION

CAPITAL DISTRICT LIBRARY COUNCIL (N.Y.)

State University Systems Libraries	7
Private College & University Libraries	12
Special Libraries: Private Non-Profit Agencies	9
Special Libraries: Commerce & Industry	8
Special Libraries: State and Federal Government	5
Public Library Systems	3 (66 libraries)
	44

[1] This and other references to the 3R's/NYSILL interface should be interpreted as illustrative of the viability of multitype, statewide networking and resource sharing, without any implication that the New York structure should be replicated in Massachusetts. Local conditions should have an influence on network configurations.

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The 3R's interface with NYSILL is likewise characterized by the multitype concept. In Massachusetts, with its single-type Regional Public Library System, the Boston Public Library serves as the library of last recourse for the system. In New York, with its multitype configuration, the "last recourse" function is shared by a group of 13 referral libraries (Table 8). Such a configuration has the obvious advantages of (a) broadening the scope of resource materials, and (b) mitigating the effect on the system of reduced funding for any particular resource library.

TABLE 8

REFERRAL LIBRARIES
NEW YORK STATE INTERLIBRARY LOAN NETWORK

American Museum of Natural History	Engineering Societies Library
Brooklyn Public Library	Monroe County Library System
Buffalo and Erie County Public Library	New York Academy of Medicine
Columbia University	New York Public Library
Cornell University	New York State Library
	New York University
	Teachers College
	Union Theological Seminary

Essentially, the planning function for such a statewide multitype structure consists of network and consortia definition in terms of:

-- participation
-- configuration
-- range and orientation of service
-- data base parameters
-- hardware and software
-- targeted end users
-- type and mix of funding
-- administrative structure

This simplification should not obscure the complexity of the process. Two absolute essentials are:

-- local participation in the planning process

-- state level direction and coordination based on (a) statutory authority, (b) sophisticated data handling capabilities at the state library development agency, and (c) appropriate staff expertise at that agency.

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IV. The Board of Library Commissioners, as the State's library development agency, has the statutory authority to deal with the problems of multijurisdiction, finance and operational and technical compatibility attendant to the planning and development of statewide multitype library networks and resource sharing consortia.

A. Problems of Multijurisdiction.

The Board of Library Commissioners already supervises the administration of a statewide single-type cooperative program (the Regional Public Library Systems) under a number of local jurisdictions (Ch. 78, Sec. 19C). The Board has further authority to "establish a comprehensive statewide program for the improvement and development of library and media resources for all citizens" (Ch. 78, Sec. 19E). In developing this comprehensive program, the Board is charged to incorporate into that program libraries, media centers and information activities of all types.

B. Problems of Finance.

The Board of Library Commissioners has authority to disburse appropriated funds to any library activity, regardless of type or jurisdiction, participating in multitype cooperative activities (Ch. 78, Sec. 19E, 19E1).

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At this point, it is in order to categorize the costs of systems development and operations, identify potential funding sources, and relate such funding sources to cost categories. Cost categories may be defined as follows:

1. Design costs--systems analyses and feasibility studies to determine the most appropriate configuration(s) for network organization and scope of service.
2. Start-up costs--the initial costs of implementation such as data base conversion, staff procurement, hardware and software procurement, etc..
3. Operational costs--annual costs of staff, overhead, maintenance and general administration.
4. Research, development and program improvement costs--including demonstration projects, software development, production of cooperative bibliographic tools, training costs, and costs of ongoing evaluation of network services and administration.

Types of funds currently or potentially available for network development and administration include:

1. State appropriations to the Board of Library Commissioners Administration and Expenses Account
2. Special state appropriations
3. Federal Library Services and Construction Act (LSCA) funds, Title I and III
4. Federal Higher Education Act (HEA) funds, Title IIB, IIC
5. Institutional budgets (including endowments)
6. Foundation grants
7. Internally generated funds (membership dues, fees-for-service, etc.)

The cost matrix (following) indicates a possible funding mix for developmental and continuing costs.

COST MATRIX - MULTITYPE SYSTEMS DESIGN
IMPLEMENTATION, DEVELOPMENT

	Design Costs	Start-Up Costs	Operational Costs	R&D and Program Improvement Costs
BLC Administration Expenses Account* (Acct. # 7000-9101)	X			X
Special State Appropriations*		X	X	
Federal LSCA I*		X		
Federal LSCA III*	X	X		X
Federal HEA IIB, IIC		X		X
Institutional Budgets	X	X	X	
Foundation Grants		X		X
Internally Generated Funds			X	X

*Funds under direct control of Massachusetts Board of Library Commissioners

C. Problems of Operational and Technical Compatibility.

With respect to library automation and networking in Massachusetts--as in many other states--the operational state of the art has proceeded more rapidly than the planning and coordinating functions. The result has been an uncoordinated and often unstructured development of computer-based local networks and resource sharing consortia.

In many instances there are sophisticated and productive activities that might well be integrated quite easily into a comprehensive statewide network.

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During the past 2 years, the Massachusetts Board of Library Commissioners has authorized distribution of almost $1.7 million in federal funds to support the development of regional resource sharing consortia. Participating public and academic libraries have added approximately $800,000 in local money.

However, these activities are the result of local initiatives and will benefit only a fraction of the State's library users. In order to maximize the effectiveness and efficiency of existing operations and broaden participation and clienteles, there now is a need for a statewide plan to include protocols and technical standards--by implication, therefore, the need for a regulatory function.

The Board of Library Commissioners, defined as a regulatory and adjudicatory agency by the provisions of the State Administrative Code (Ch. 39A) has the authority to promulgate the necessary procedural and technical standards to effectively develop and coordinate a statewide multitype library network.

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V. *In order to exercise its statutory authority, the Board of Library Commissioners must have sufficient and appropriate staff to fulfill its responsibility for the coordination of technological development and the direction of planning, research and evaluation.*

In spite of the limitations imposed by the availability of administrative funds over the past 3 years, the Board has been able to acquire the experience and expertise necessary to proceed with its planning, research and evaluation responsibilities attendant to the development of a statewide, computer-based library resource sharing network.

APPENDIX II

Policy Report 13

Libraries of the

Massachusetts System of Higher Education

(Senate 2222, June 1981, Vol. II)

Policy Report #13: Libraries of the Massachusetts System of Higher Education

Most libraries within the Massachusetts higher education system are places where information is sought and consumed in enormous quantity. Faculty routinely assign long lists of readings which students must assimilate; heavy use tends to generate more use, every use leading to another. If each of the 96,000 students in the Massachusetts system of higher education borrows a mere ten books from the library in one academic year (a very conservative estimate), nearly one million books or about 400,000 titles will have circulated. The actual figure for books read, consulted, and cited is at least double that estimate. At the same time, the useful life of most books after publication is only about eight to ten years, two to four years for journal articles. At these rates, the utility of a library collection, or portions of it, may have totally depreciated within just ten years.

These short lives and high circulation prescribe constant replenishment if libraries and the educational process are to flourish. What is the cost of replenishing the Massachusetts higher educaiton library? If the 400,000 circulating titles are no older than ten years, then about 40,000 titles become obsolete each year. To replace that many books — just books, not journals or other publications — would cost $1.0 million each year.

Librarians have always rationalized their budget requests by detailing the great volume of material actually published, without reference to actual or potential use, and then arguing that to achieve excellence — to build quality, in-depth collections — the library must acquire every relevant publication. Many librarians now concede that this approach is unrealistic, but are at a loss for alternatives. To acquire every relevant publication could cost millions of dollars each year for just one library.

Recent studies have shown that even though individual libraries do not own all the books and journals which faculty and students want, a great many of the materials purchased are never used. One approach to this dilemma has been the fairly successful tradition of cooperation through interlibrary lending. Though this tradition is a direct result of tight budgets and the inability of any one library to be self-sufficient, the practice has never in itself had much influence on budgeting for library materials. Librarians everywhere have been slow to adopt the argument that an output product (interlibrary loans) should have an effect on input (which books should be purchased), partly because of possible loss of autonomy and partly for fear of adverse effects on the quality of collections.

Much more needs to be learned about how libraries are used and about the desirability of cooperative collection development. Relatively little money has been expended in American libraries on resolving questions of this sort. On the other hand, enormous sums and energy have gone into the development of technical improvements to library processes at the regional and national levels.

The challenge of library development in the Massachusetts system of higher education is in the areas of better understanding of how collections are used, cooperation, and technological application.

The informal group of librarians called the Massachusets Conference of Chief Librarians of Public Higher Educational Institutions (MCCLPHEI) has often been cited as the only group in the system with a history of successful cooperation — one that cuts across all segments (university, college, and community college). Despite lack of charter, official recognition, or coordinated administration, MCCLPHEI has made considerable achievements, notably in funding, centralized purchasing, and interlibrary loans.

Arguments for more formal cooperation and coordination are many. The most important reasons are elimination of some duplication, greater cost efficiency, greater availability of materials, better inventory control, and speedier access.

Funding and Budgeting

Since the early seventies, the MCCLPHEI group has cooperated in presenting annual book budget needs. As a result, its libraries have received several million dollars for acquisitions, al-

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though the appropriations have not brought its libraries up to national standards.

Budget instability has been a major problem. Being highly structured organizations with unchanging functions from year to year, libraries simply cannot function efficiently when their budgets fluctuate wildly from year to year. Fluctuation has a traumatic effect on journal subscriptions, book acquisitions, work routine, and staff continuity.

If a library's appropriation decreases, the shortage must somehow be made up. MCCLPHEI libraries have had to make up deficiencies from trust funds, supplemental fees, continuing education, and donations — sources as tenuous and uncertain as the annual appropriations.

Not addressed sufficiently in annual appropriations are all the other costs of running the libraries. These include much more than the purchase price of books and journals. Libraries also purchase a wide range of materials, such as phonorecords, manuscripts, and videotapes. In addition, the costs of travel, supplies, equipment, and rentals must be considered.

There is also the cost of labor. In many, if not all of the institutions, staff positions are allocated to the library after all other positions have been assigned. With a fixed number of positions for each institution, this often means that the libraries simply do not function well. Library staff positions should not be in competition with other departments; rather, they should be a function of faculty size and student enrollment. There should also be a clear statement of priority in relation to the academic programs in the system.

Apart from salary costs, certain technical functions such as acquisitions, cataloging, circulation, copy services, interlibrary lending and computerized bibliographic searching, require ever greater budgetary outlays, since many of these services are best done or are only available through commercial vendors. Serious consideration should be given to the inclusion of these costs in annual library appropriations.

Finally, budgeting for libraries suffers from the higher levels of inter-institutional competition, in contrast to the spirit of cooperation which exists among the librarians themselves. The Committee believes that the recent reorganization of higher education provides an opportunity to resolve some of these problems.

Standards for Library Collections

If a library has fewer volumes than required by official standards, the institution is apt to lose out in several ways — in federal grants for libraries, in attracting scholars and new faculty, and in keeping its faculty. A demoralizing conclusion is that if an institution is not committed to its library, it is not committed to its faculty, its students, or quality education in general.

Each year MCCLPHEI compiles statistics on the extent to which its holdings meet the minimum standards formulated by the Association of College and Research Libraries (ACRL), a national organization. The MCCLPHEI statistics consistently show substantial deficiencies in the system's library collections. With the possible exception of the University of Massachusetts-Boston, no institution has the minimum number of volumes required to meet its program. The range of deficiencies extends from a minimum need of 7 percent of volumes at Salem State College to a maximum of 65 percent at the Massachusetts College of Art. The average percentage of need for the five universities is 60 percent, for colleges 65 percent, and for the community colleges about 74 percent. Total shortfall is over 1,000,000 volumes; providing these volumes would cost in excess of $34 million, according to MCCLPHEI (See table 1).

The standards for college libraries are based on "allowances" for the number of FTE (Full-time Equivalent) faculty members, FTE students, and the number of undergraduate, Masters and Ph.D. fields in each institution.

The standard for community colleges is based on a formula devised by the Massachusetts Board of Regional Community Colleges, using minimum numbers of instructional resource units (IRU's) per group of FTE student enrollment. IRU's include books, films, audio tapes and records, and other non-book materials. This formula, inturns, is consistent with standards for two-year colleges published by ACRL in 1979.

The thrust of the ACRL standards is to help libraries acquire at least minimal collections to support the academic programs of their institutions. The formula for computing the required

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Table 1

Total volumes owned, total volumes needed to meet ACRL standards and estimated cost, colleges and universities — 1980

	Total volumes owned	Total volumes needed according to standards	Dollars needed to meet standards
Boston State	165,700	256,650	$ 2,074,000
Bridgewater	201,800	364,550	3,710,600
Fitchburg	180,800	206,200	579,000
Framingham	143,300	169,000	587,200
Mass. College of Art	64,000	181,600	2,683,000
Mass. Maritime	49,600	100,300	1,156,700
North Adams	118,500	127,000	188,000
Salem	275,000	297,900	521,600
Westfield	134,800	179,030	1,008,000
Worcester	163,200	306,500	3,267,000
Lowell	295,000	450,500	3,534,000
Southeastern	270,000	425,000	3,534,000
Univ. Mass./Amherst	1,825,000	2,112,000	6,557,000
Univ. Mass./Boston	350,900	536,000	4,013,000
Univ. Mass./Worcester	82,000	148,000	1,503,000
TOTAL	4,319,600	5,850,230	$34,916,100

number of volumes was devised by a committee of experienced librarians. The formula was not derived mathematically but rather intuitively. Thus, it has serious empirical shortcomings and is not universally accepted. The standards have not been adopted by an accrediting authority. ACRL itself has no authority to withhold accreditation from institutions, partly because its members are individuals, not institutions. Libraries as such are not accredited by any agency.

The standards do have considerable persuasion, in that they are officially published by the only national academic library organization. They are widely cited, extensively used to justify budgets, and are perhaps the only authoritative, quantitative foundation on which to build collections.

Library Collections and Policy

Two philosophies of building library collections exist throughout the country. The first is to build collections of both breadth and depth, covering all scholarly fields and acquiring all relevant materials within each field, for all scholars wherever they may be. The second is to build basic or minimal collections which reflect or match the programs of the institution. The first is a luxury which few libraries can afford, but to which many libraries aspire. The second is prerequisite. Yet, libraries of the state's higher educaution system consistently fail to meet this prerequisite.

Considerable variation exists in the library needs of the many academic programs in the system. For example, it is generally conceded that humanities and social science scholars need and use more books in proportion to journals, while scientists require a different proportion, and engineers require more transitory reports and specifications. Furthermore, the cost of materials varies from one discipline to another within the humanities and sciences; art and technology books are the most expensive, literature the least.

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...nable to expect that each indi... ...ubscribe to the second philo... ...the system as a whole could ... That is, by careful assign... ...responsibility to each institu... ...stem-wide knowledge of each ...lection, the thirty collections ... as one large cooperative collection of great breadth and depth, covering all fields for all ... within the system as well as without. With ... delivery from one library to ... duplicate books and journals in more than one library would be substantially diminished, with consequent parsimony.

Even now, with little or no knowledge by any library of what the others have, nor what should or should not be duplicated, this "system-wide library" could be achieved, given adequate funding and proper management. The technology is available. And, although costly in the beginning, the "system library" would achieve economics by eliminating unnecessary duplication and at the same time identifying necessary duplication. The end result would be better collections, greater accessibility, more use, and thus greater accountability.

The Serials Problem

In many libraries, serials (scholarly and scientific journals and periodicals) constitute one-half the library. Faculty consider them to be essential for their research and, to a large extent, critical for graduate study. Until recently, the serials budget was typically no more than 25 percent to 50 percent of the total, but inflation has changed that percentage drastically. Because librarians are extremely reluctant to interrupt the continuity of their serials, they continue their subscriptions even though prices have risen faster than for books and other components of the library budget. As a result, serials now account for 60 percent to 90 percent of the total budget in some libraries. Thus, while libraries struggle to maintain the integrity of their serials collections, their book collections depreciate at a faster rate.

To seek appropriations to offset the increased cost of serials without at the same time seeking alternative approaches would be skirting the issue, for the problem is incessant and nationwide. Again, resource sharing can help alleviate this problem. The exchange of periodical articles between libraries has been vigorous, but more can be accomplished by reducing the number of duplicate titles. Duplication is considerable, even while libraries proclaim deficiencies. Duplication is often expressed in terms of average number of copies per title. Actually, studies show a large number of titles with one copy only, a smaller number with two copies, still fewer with three copies, and so on, with a relatively small number of titles having a large number of copies. The average number of copies in the Massachusets system is probably less than six. Reduction of duplicates is not a popular approach but could be more acceptable if it were balanced by adding copies of high use titles.

Some groups — for instance, in Pennsylvania and Minnesota — are seriously considering eliminating some duplicate subscriptions so that their joint budgets may guarantee retention of at least one copy of every relevant title. Sharing would be done by fast copy service. Restraining this approach, of course, is the new copyright law which limits the number of photocopies of an article for scholarly purposes. Nevertheless, the potential for cost-effectiveness with coordinated subscriptions and careful attention to the needs of specific programs at each institution is considerable.

To take a single example, at least six libraries in the Massachusetts higher education system subscribe — at an annual cost of $5,000 per subscription — to *Chemical Abstracts*, an index to 12,000 chemical journals. It publishes about 240,000 abstracts per year, and is one of the most essential tools in every university library. The format of *Chemical Abstracts* requires that each library subscribe to all 240,000 abstracts, even though its users may use only a few hundred. Its cost-effectiveness is therefore questionable. There is a potential solution to this problem, however. The index to *Chemical Abstracts*, a costly component of the subscription, is searchable by computer on a service basis. If MCCLPHEI libraries subscribed to this service, several subscriptions to the index could be discontinued.

The traditional approach to building serials collections — the attempt to acquire every possible journal relating to every discipline — can be exorbitantly expensive. For each discipline or

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subdiscipline, there may be as many as 40 relevant journals. The number of disciplines and subdisciplines in the Massachusetts system is related to the number of faculty. If there is one subdiscipline for every 10 of the 6,000 faculty members, there would be about 600 subdisciplines and 24,000 relevant journals. At an average subscription price of $50.00 each, the annual cost of one copy each of the 24,000 titles would be $1.2 million. Add to this another $200,000 for general periodicals, and the figure is nearly $1.5 million, increasing at an inflation rate of 15 percent per year. With many of the 30 libraries each demanding their own copies, this approach is obviously not feasible.

There is a more sensible approach. In every discipline or subdiscipline, there is a core of essential journals which accounts for most of the use. For example, a core of 5 journals may account for 1,000 uses in a given time period. To account for another 1,000 uses in the same time period may require another 25 journals, and for another 1,000 uses another 125 journals would be required. Obviously, the first 5 are the most cost-effective and the last 125 the least. Thus, core journals should be identified for every discipline, and a sufficient number of copies should be purchased to guarantee availability throughout the system. As funds allow, the next 25 and as many as possible of the following 125 should be purchased. This approach depends upon the identification of both subdisciplines and core journals, which can be difficult. There are many studies using this approach for isolated disciplines, with a few applications to individual libraries, but none for a group of libraries. Nevertheless, even limited application to MCCLPHEI libraries would result in improvement.

On-Line Computer Data Bases

Not only *Chemical Abstracts*, but a large number of computerized indexing services in science, social sciences, and the humanities are now available and are being used by some of the MCCLPHEI libraries. The possible impact of these services on the periodical subscriptions in the entire system could be considerable.

These data bases now contain millions of bibliographic records available to libraries by subscription. Their dollar value is already in the many millions. Most of them are offered by profit-making vendors. It has been forecast that by 1990 many thousands of data bases containing both bibliographic and full-text information will be available. These data bases inevitably and fundamentally will affect library operations and services, and are one more factor contributing to the obsolescence of any book published today.

Libraries can now make a complete literature search of almost any topic in minutes, at an averge charge by the vendor of about $34.00. The product — a computer printed special bibliography, often with an abstract — introduces an entirely new budgetary requirement, a process which heretofore has been performed manually and was never considered a budget item. At the University of Lowell, for example, 125 searches were performed in FY 1980, the first year of implementation, at a cost of about $3,750. As of this writing, volume in FY 1981 has already doubled. Systemwide, the number of searches could reach 5,000 by 1985 at a potential cost of $175,000 or more. This would enable libraries to have ready access to thousands of serials not in their subscription lists, worth millions of dollars.

The Acquisitions Process

Acquisitions refers to the tedious and detailed process of purchasing library materials. Librarians must have extensive knowledge of what is being published, where to obtain it, and how to obtain the best discount prices. The acquisitions process is labor intensive, requiring long hours consulting catalogs and verifying bibliographic information to make sure that a book being acquired is not already in the library and that the information is correct.

MCCLPHEI recognized early on that each of its libraries was duplicating this process and consequently purchasing many of the same books. This recognition led to the popular "BCL project" — or "Books for College Libraries" — from FY 1969 to FY 1975. The BCL project, funded through the Board of Higher Education, expended more than $11 million and acquired approximately 943,000 volumes for the system. The books were centrally acquired and the project was administered by the University of Massachusetts-Amherst. The cost of acquiring and processing these volumes ($1,148,070) was well below what

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the total would have been if each library had acquired and processed its own. Serious consideration should be given to revival of the "BCL project" in some form, capitalizing on its mistakes and benefiting from its achievements. In any case, new technology has introduced many improvements which could be advantageous to the system.

The Cataloging Process

Every book, journal, article, manuscript and phonorecord added to the libray must be described precisely, simply, and consistently so that it may be identified and located by a potential user. Until recently, every library acquiring the same title had to recatalog what each had already cataloged. If all 30 libraries had the same book, the same work was done not once, but thirty times — a costly situation, since the cost of cataloging a book by old methods was up to one-fourth of the purchase price of the book. If $1,000,000 was spent for books, another $250,000 was either spent or absorbed in cataloging them, money which could well be spent for additional books.

Now, however, technology is available through OCLC, Inc., a not-for-profit company offering computerized services for libraries. This service reduces costs considerably through economies of scale; a book is cataloged once and the information is made available to others at a unit price of $1.87 per book. To date, ten libraries in the system are buying OCLC cataloging information. Another four have recently joined. Participation by the smaller libraries is usually not cost-effective. If, however, all libraries in the system pooled their cataloging budgets, each could receive OCLC cataloging data cost-effectively.

An important and substantial by-product is the storage of this cataloging data on computer tape, providing the basis for a common, on-line data base for ready access and use by all the libraries in the system. As of this writing, only the University of Lowell and soon the University of Massachusetts Medical School-Worcester, have made use of their OCLC data in this manner. The University of Massachusetts-Amherst has developed its own computerized cataloging system and is planning a more complete system in cooperation with four private colleges in the Amherst area. The data may also be used for interlibrary loans for circulation processes, and for management information. The estimated cost of providing OCLC cataloging for the entire system, based on FY 1981 book acquisition, is $100,000.

The Circulation Process

A library which circulates 100,000 volumes in one year will actually record double that many transactions, for it must not only record check-outs but check-ins. Each of these books must be moved, shelved, or otherwise handled several times. Exact records must be kept on what books are in circulation and who has them. If books are not returned on time, overdue notices must be sent. Thus 100,000 circulations may mean several hundred thousand transactions, all handled manually — a labor intensive and costly process.

Many libraries throughout the country have computerized this process. In the Massachusetts system, only the University of Lowell has installed state-of-the art equipment for this process. The system is expected to improve labor costs, but unilateral use of a computerized system of this sort is not as cost-effective as one which serves a number of libraries jointly.

The large number of transactions which take place provide the potential for excellent data on what happens to the books that are purchased. For example, if all books in the collections were grouped according to academic disciplines, and if the circulated books were grouped in the same way, an excellent tool for library accountability would be created. It could be determined how well the collections match demand in each discipline, and reallocation could be done accordingly. Studies in other systems have uncovered instances where some disciplines have had a great need for books and journals while others could barely make use of what was purchased. Such inequity is costly and demoralizing for many disciplines.

The computerized cataloging system described above also permits computerization of circulation. Reduction of labor costs, accountability, increased availability of books, and more efficient inventory are only a few of the potential improvements offered by state-of-the-art library technology.

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Interlibrary Lending

American libraries have loaned books to each other for many years, but until recently the process of finding a book was tedious. Introduction of OCLC has enabled libraries to identify locations almost instantly. Along with cataloging information, OCLC also provides the names of libraries owning the book. The most important benefits are time saving and the sharing of books, a cost-saving incentive. Obviously, if all libraries in the Massachusetts system had access to OCLC, much less duplication of collections would be required. The 14 MCCLPHEI libraries now subscribing to the OCLC system may also subscribe to its interlibrary loan system. OCLC's unit charge for an inter-library loan transaction is $1.48; this compares to the average price of a book, which is $25.00. If MCCLPHEI libraries borrow a mere 10,000 books, they would obtain $250,000 worth of books for only $14,800.

A past achievement of MCCLPHEI called WILL (Walk-in interlibrary loan) permits any student in the 30 institutions to walk in to any library and borrow a book with no special permit other than an enrollment identification card. Unfortunately, the student must go to the library to find out whether it has the needed book. Installation of OCLC throughout the system would eliminate that constraint.

Conclusions

There are many advantages to increased coordination and the development of a system-wide library network within higher education in Massachusetts. Elements of such a system would include: (1) the systematic assignment of collection-building responsibility strictly according to academic programs; (2) the acquisition of books strictly according to use; (3) serials subscriptions according to utility curves; (4) on-line cataloging (OCLC); (5) on-line catalog access by each library to the books and journals in every other library; (6) on-line circulation, providing inventory control in each library, and information in one library as to whether a book is in circulation in any other library; (7) the expansion of on-line bibliographic searching and instant access to thousands of serials; and (8) on-line interlibrary loans and an increase in reciprocal borrowing.

To one degree or another, these developments already are taking place, some of them rapidly, but all are piecemeal and uncoordinated.

A coordinated library system would be a practical, creative, and cost-effective response to the existing need for library resources in schools of higher education in this state. The Committee endorses the implementation of such a venture.

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